ANNUAL MOTOR TRUCK NUMBER

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AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

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No. 18

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AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

VOL. XXXVII NEW YORK—THURSDAY, NOVEMBER 1, 1917—CHICAGO No. 18

Automobile Factories Asked to Plan For Munition Manufacture

This Conversion Will Lower Production Without Crippling Selling Organizations, But Will Demand More Efficient Merchandising—N. A. C. C. and M. A. M. Ask to Supervise Steps in Plan

WASHINGTON, NOV. 1—Because of evidence of a possible shortage of alloy steels, copper and brass the War Industries Board has suggested to the automobile industry the necessity of curtailing production and having this slack in manufacture taken up with the manufacture of munitions and other munition necessities.

Manufacturers Asked to Co-operate

To accomplish this conversion of activity in the automobile factories the automobile and accessory makers are to meet with the War Industries Board this week and evolve rational plans to accomplish this without undue disturbance. The accessory makers will meet to-morrow under the leadership of the Motor and Accessory Manufacturers and on Friday the automobile makers represented by the fifteen directors of the National Automobile Chamber of Commerce with the addition of the Ford Motor Co. will discuss the problem with the War Industries Board.

To Make Conversion Gradually

The dominant idea in these conferences will be to affect this reduction gradually so that both the automobile and parts makers and also the sales organizations throughout the country can make the necessary changes with the least hardship. It is, in short, a case of the two controlling organizations representing the industries taking the matter in

hand instead of having the entire job done by the government, and perhaps in a much less considerate manner.

One thing is certain, namely, that automobile production will be reduced, but this will be done without needless injury to the thousands of dealers throughout the country who have huge investments represented by agencies, service stations, etc.

It is expected that some plan of reduction in production of the automobile makers will be evolved that will not place all of the hardship on one firm at the expense of another. It is expected that the reduction will be so accomplished that a due proportion of reduction will be required of each firm perhaps in ratio to present demand of the respective firms.

Every effort will be made to effect an impartial curtailment in which all will share, and it is fortunate if this can be worked out by the automobile organizations rather than by any outside organization.

Factories Will Be Busier

So far as the automobile factories are concerned, there should not be any difficulties as they will unquestionably be busier than they have been for some time as many of them have been operating at lower capacity for some time, it being commonly reported in these columns that the industry has been off from 40 to 60 per cent, according to demand in different parts of the country.

In these war days there should not be any needless building of additional factories to manufacture munitions when there are automobile factories that are not working to capacity. This readjustment, it is expected, will give these factories special work just as has happened in England and France. In both of these countries, the automobile factories are busier than they have been for years but some are making aviation engines, some tank engines, some lathes, many ammunition, others gun parts and many ambulances and equipment.

First Step in Conversion

The present act of the War Industries Board is the first step in such a conversion, which it is expected will not reach anything like the same proportions in this country as has been necessary in Europe.

The conversion or reduction in manufacture, it is assured, is such as to permit practically all organizations to keep intact their selling organizations of distributers and dealers. This means that all distributers and dealers will have a reduced number of automobiles to sell, but as the demand has been off very much in cities, this will not seriously affect many at the present time.

Must Adjust Organizations

There are, however, many dealers of certain makes of cars that are very much in demand that will not be able to get as many cars as they have been in the habit of getting and they will have to adjust their organizations and plans to the new conditions.

Such a reduction in automobile output has some bright spots in what would normally appear as a rather dark-colored picture. Without doubt, the dealers' bug-bear of the used car will immediately cease. No dealer will have any reason to take in a used car in part payment for a new one on any other basis than that on which he can make good money.

Dealers who have been taking a loss on used cars can clear their skirts of such bad business and start out to make money on every used car that passes through their hands. This should have a very salutary effect on the industry and gives promise of solving in one stroke a discouraging problem that dealers have wrestled with for years.

Move Should Help Business

Manufacturers and distributers and dealers will naturally look more carefully to all selling expenses and will use greater judgment on all matters entering into merchandising. The present reduction will really demand scientific merchandising. Dealers will have to stop the many leaks that they have been enduring for years. It is something like the gasoline situation, where it is possible to save more gasoline than our Allies will need just by stopping all of the gasoline leaks and using rational economies with the dealers. The dealer must look to it and stop all leaks. He must do it of necessity.

It is very possible that car prices will immediately increase and it is unquestionably certain that car sales will be more business-like in 100 per cent of the cases than they have been in the past.

Must Keep Business Going

Fortunately, official Washington has many broad-minded business men assisting the government who are looking at the present problem divested of all partiality frills and in the white light of war necessity. The government is being ably advised that to win the war we must subscribe for not one and two, but three, four, five, six, seven and eight, and perhaps more, Liberty Bond issues and that unless industries are kept alive and in healthy condition it will not be possible for these future bond issues to be taken up.

The automobile selling industry has always been liberal, in fact super-liberal, in its subscriptions. It will continue to be so if the government carries out its plan to effect a reduction but so arranges it as to avoid hardships and give ample time to accomplish the necessary conversion of activities.

Every Wheel Will Turn

In England and France, every automobile dealer who is equipped with any supply of machinery is busy making shells or doing many of the ten thousand government necessities. The same will undoubtedly happen in America so that those dealers with large service stations and large machine equipment will find themselves perhaps busier than they have been for some months.

The meetings on Thursday and Friday should do much to clarify the situation and evolve desirable courses of action in this conversion program.

Engineering on Saner Lines

More Good Truck Parts Available for Assemblers—No Radical Changes, But Much General Improvement in Design

AS in the passenger car business, so with the truck, the great trouble engineers have had to overcome is poor grades of fuel, or rather their effects upon the engine, but this has not taken all their attention. To make the briefest summary, the engineering advances of the year have been:

1. Better handling of low-grade fuel,
2. Better springs and improved flexibility,
3. Better small trucks of 1 ton and under,
4. Better and more big trucks of 5 tons or over.

The fuel matter is still the gravest problem, and it is only partly solved. The bulk of the present truck motors do not handle really bad gasoline as well as they might. The exceptions to the rule have come into being, however, and these leaders will serve as examples for the rest.

Much New Design

A general wave of redesign has run through the engine builders' plants. The stock truck engine of 1917 was hardly as highly developed as the passenger car motor, but some of the 1918 truck motors are the best yet built for heavy fuel work. For this a good deal of credit must go to the military truck, for it brought the engine men together, enabled them to interchange ideas in a new way, forced the open discussion of some things engineers had been trying not to think about and generally stimulated effort. The results of all this are not yet uncovered, but they will be very soon.

Another much mooted point settled by the military discussions was Hotchkiss drive. By the unanimous vote in its favor a good many engineers who had fitted radius rods to gratify the sales department were relieved of further necessity to do so.

This means a simplification, and the tendency to reduce the number of parts is very noticeable throughout the chassis. It seems likely that the propeller shaft of large diameter tube may remove the necessity for a middle bearing in the drive, for example. Elimination of grease cups from awkward parts of the chassis is also a trend, and this with other things points to a better realization by the engineer of the importance of making maintenance easier. The service a truck will give is greatly enhanced if it is easier to keep in proper condition.

Better Suspension

Another truck feature which is distinctly better is the springing. We are learning more about spring materials and spring forms. Multiple leaf springs, though expensive, tend to make the truck ride better, and they also reduce the difference in effect whether the truck is loaded or empty. Here again is nothing radical but merely gradual development along natural lines of progress.

In transmissions there is a trend toward the four-speed gearset, and it is noteworthy that many engineers believe it is coming even though they are not yet using it. This means that engineers are going to create a demand that the parts makers will supply.

The Good Small Truck

The small truck has always been a problem. The precise points wherein a ½-ton or ¾-ton truck should differ from a passenger car chassis are hard to define. Without question the success of the Ford as a delivery vehicle, and that of the Ford conversion attachments, has opened the eyes of many to the vast amount of work a not very strong chassis can perform. The light truck must be light. Its value is greatly lessened if it is not speedy and cheap to operate. That pneumatic tires pay on anything under 1½ tons is settled absolutely, and the ton truck does not need to be so very much stronger anywhere than a good passenger machine. Still there are differences, and there are now several small jobs which are the best propositions ever offered anywhere for the work they suit.

At the other end of the scale are more big trucks. For supplementing railroad work and generally speeding up transportation in these congested times the 5-ton chassis is a most economical machine. Simplification of layout and improvement of engine have perhaps had more effect on the big trucks than the small. The larger the chassis the more difficult is it to avoid needless weight and yet make it strong enough. There is now enough accumulated data on five-tonners to permit engineers to design new models with greater certainty of results.

Frames Are Stronger

There is some change in frame construction since the breaking of frames is a trouble all truck manufacturers know. Usually it is caused by overloading, but even so makers desire to render it as improbable as possible. Hence we see more and more manufacturers avoiding the drilling of holes in the side rails as much as possible, particularly in the bottom flange. Every hole in a frame weakens it wherever it is drilled, but holes in the vertical part do little harm, while those in the flanges are quite liable to start cracks.

On details of equipment there is much less demand for electric starters than was expected, and there has been a good deal of electrical trouble on trucks so equipped. This seems to be due to two things—first, to the battery which is not benefited

by the bumping of solid tires, and second, to insufficient strength in the starting motors. Passenger car equipment is hardly heavy enough for truck service. Probably a truck engine is started many times more in a day than a passenger car engine in a week, and this puts increased work on the bearings and the gearing. To some extent it seems likely that more robust generators will be needed for battery charging, even where lighting only is required and not starting also; in fact, from the wiring up there is a prevalent idea that truck electrical gear is not yet as suitable to its job as is the electrical equipment for passenger cars.

Starter Must Come

None the less it is common sense to assume that the starter must eventually become conventional truck equipment. The majority of truck makers are fighting shy of it because they fear it, Packard being a notable exception. This concern is convinced that the starter is a great gasoline saver. Also it is always good to consider the comfort of a worker, and the starter adds greatly to the ease of truck driving. In this connection it may be remarked that better seating and thicker cushions are being talked of a good deal, though seldom used as yet.

On the starter question the mechanical difficulties can surely be overcome readily. It is possible that the motor should be double geared, that the teeth of the Bendix should be of a larger pitch, that the flywheel should have a hardened or toughened steel ring gear. This needs only careful design to work out perfectly. The battery is every day getting more robust in itself, and better truck suspension helps it too. Incidentally, there is much difference of opinion as to the advantage of mounting the battery on supplementary springs of its own. Locomobiles have a spring carrier which their laboratory tests have shown to protect the battery a great deal, but many other concerns pin their faith to an absolutely rigid mounting, saying that the great thing is to make the box immovable. Probably this means that a sprung battery box must be sprung correctly, that while springs can help if properly proportioned, they may hinder if of unsuitable design or arrangement.

On electrical equipment the military truck is a particularly worthy study, as all the parts from the switch up are designed for truck service exclusively. It is a pity that the specifications did not call for a starter, since had this been worked out as thoroughly as the rest it would have helped to reach the goal.

While there has been little change in brake design there have been great improvements in layout, eliminating whip in the connections and lost motion which have the effect of giving more power. There seems to be an undercurrent of trend toward the transmission brake because those firms who have been using it are so strongly in its favor. The idea that it put dangerous stresses on the axle gearing is more or less exploded, and the main objection now seems to be that it has to be made big if it is to be durable. Probably there is not much to choose between the two systems if both are equally well designed, since the removal of 100 lb. of weight from the axle is not very important when the whole part weighs nearly 2000 lb.

In tires the pressed-on solid is slowly but surely pushing the demountable into the discard, the process speeding up in direct proportion to the distribution of presses throughout the country. The pressed-on tire is lighter and a better proposition provided access to a press for changing is possible to the truck user. There is, of course, increasing interest in large pneumatic tires for 2-ton and smaller sizes. These tires are still much more expensive than solids, and it is doubtful whether they make enough difference to the repair bill to warrant the increased cost, *provided the operating speed remains the same.* The indeterminate factor, which may make all the difference, is the ability given the truck with pneumatics to work faster. On some service the addition of, say, 25 per cent to a truck's daily mileage would make the truck a much better investment, and it is in such cases that the real field for the big pneumatic appears to lie.

Between the two sorts of rear wheel solid-tire equipment the big single is being tried out extensively in competition with the dual. The former is the more economical from tire wear standpoint, but it is claimed by some engineers that the rolling resistance of the big single exceeds that of the dual on hard roads. The difference cannot be very great and miles per dollar of tire is likely to be the deciding factor.

British tank in Liberty Loan parade New York City, October 25

Fuels Control Engine Design

The Limit Reached with Old Style Engines and Carbureters—Two Theories of Vaporization Induce Experiments on Different Lines

THERE are several new fundamental problems which are affecting truck-engine design this year. Probably the two principal influences are the fuel question and the demand for the elimination of service.

The influences of the descending quality of fuel is felt in a great many more ways than simply the trouble in getting started on a cold morning. Indirectly it has a bearing on the entire design of the cooling system. It affects the design of the castings; it affects the problem of lubrication, the matter of compression, and, of course, the entire arrangement of fuel supply and carburetion. The result of the influence of the descending quality of fuel is probably the most noticeable factor in the engineering changes of motor trucks for 1918. It was expected to some degree a year ago that in 1918 we would have kerosene-driven trucks as a common occurrence on our streets, but we must face the matter squarely and state that we have not as yet learned to burn kerosene in our trucks, and, in fact, are having great difficulty in burning what passes for gasoline at the present time.

Changes in Engine

The changes which must be made in the engine to accommodate it to the fuel which is secured from the curb gasoline station at the present time show the importance of detail as influencing the entire performance of the truck. We see that this year on truck motors, taking a survey of the entire field, that water jackets have greater capacity; that they are extended lower down the sides of the cylinders; that radiators are larger and more efficient; that gas passages are larger and less prone to be complex in their interior shapes; that greater care is given to the cooling of spark plugs; that the water is led into the detachable head through larger openings, and from the cooling standpoint alone a considerable change has been made, taking motors in the aggregate.

From the standpoint of carburetion, we find that the necessity for the addition of heat to assist in the vaporization process is universally recognized. The method in which the heat is applied, however, varies considerably. Some favor the thermostatic control, others a straight exhaust jacketing of the carbureter, and others use a more complete method in order to vaporize the varying constituents which compose the complicated hydrocarbon fuels. Going carefully over the field, it will be noted that the closest students of this question have recognized the necessity for vaporizing the fuel in stages. The greatest heat is applied closest to the cylinder, and the lesser amount of heat in the float chamber or main jet of the carbureter. This application of the heat by gradual stages takes off the products in the order of their volatility with the least danger of cracking. The globule of fuel dwindles in size as the molecules of the heavier constituents are removed by the graduated stages of temperature until it finally disappears when the heat equivalent to the end point, or boiling point of the heaviest constituent, is reached.

The practical application of this method is a direct exhaust contact with the upper end of the intake so that the greater part of the exhaust heat is given off at this point. The exhaust gases which have been partially cooled by giving up some of the heat in the intake gallery travel downward in the opposite direction to the fall of the intake, so that the time the bowl of the carbureter is reached the gases are only fairly warm and the graduated stage of temperature is secured. This arrangement, however, does not suffice unless there is some method of regulating the application of the heat depending upon the temperature of the outside atmosphere. This arrangement may be automatic or by hand, but the latter predominates.

Two Theories

There are two main theories of action beyond the conventional, in connection with which the vaporization problem is being attacked. Both employ heat but apply it in different ways. In some cases the two systems are combined so there is no sharp dividing line. The older system of the two applies heat to the air before the mixture with the fuel is made, the newer heats the liquid in the mixture but endeavors to avoid heating the air.

First considering the former system, this has grown gradually. Years ago a few engines were supplied with water-jacketed manifolds and even with carbureters with water jackets.

Fuel to-day needs heating in some way because it will not *remain a vapor* at ordinary atmospheric temperatures. The old gasolines needed only to be sprayed in a good carbureter to be converted into a gas which would stay as a gas till it was burnt in the engine. Modern fuels even better atomized in the carbureter will not retain the vapor form for any appreciable length of time unless heat is applied in some way.

Water Heating First

The first indications of coming trouble started years ago, when it was found that engines would not run well till they were warmed up, and this led some manufacturers to adopt water-jacketed intake manifolds and even water-jacketed carbureters. This in turn led to the intake passage cast inside the cylinder block with as little outside manifold as possible, but the mild degree of heat obtainable in this way is not enough to handle 1917 fuels.

The use of hot air taken from a stove on the exhaust pipe and led to the carbureter intake is also old. In the days when most carbureters had a main air and an auxiliary air valve, it was usual to put a hot-air supply on the main entrance, but not to heat the auxiliary air; now carbureters with only one air port are common and these usually have a hot-air supply, which thus takes care of all the air.

And there are cases where two port carbureters have been supplied with duplex hot-air pipes. However, hot air alone is not enough if the intake manifold is either long or all exposed, because the air is chilled by the

vaporization of the gasoline and drops of liquid will condense unless precaution is taken to keep the gas hot *after* it has passed the carbureter and is on its way to the cylinders.

With a manifold entirely within the cylinder block and with hot-air feed to the carbureter, fairly good results are obtained but there is a disturbing influence exercised by the throttle. When the throttle is partly closed the gas which passes it immediately expands, and the expansion chills it. When the gas consists of air wet with gasoline the chilling causes drops of liquid to condense. At fully open throttle there is no expansion effect. This means that to maintain a good mixture more heat is needed for part throttle running than for full throttle. Unfortunately for the engineer the time when he has most exhaust heat to apply is when the engine is wide open, and with closed throttle the heat which is wanted to protect the attenuated gas is not available. The faster the engine runs the less is heat required and the more is to be had from the exhaust pipe. One way out would be to make the stove so large and so close fitting that heat enough would be available for low throttle running, but if this were done then the air would get too hot at full throttle. If it is overheated it is so greatly expanded that a much smaller weight of air can be drawn in by the pistons, and this causes a falling off in power.

Needs Dual Control

Thus if hot air drawn from the exhaust pipe stove is depended upon to vaporize the fuel and keep it vaporized, some additional control is desirable to prevent too much heat in the air at high speeds and to assure enough at low speeds. One of the most ingenious ways in which this has been worked out is found on Nash trucks. Here the main air intake is from a hot-air stove on the exhaust pipe and a shutter in the pipe allows cold air to be admitted if required. The real purpose of this cold-air door is to enable the air temperature in the carbureter to be kept more or less the same whatever the atmospheric temperature may be. It is adjusted by hand when the engine has warmed up and can then be left alone all day. In addition to this hot-air supply, there is a jacket round the carbureter which is connected to the inside of the exhaust pipe, so that exhaust gases can pass around it and heat up the whole instrument. The hot air, plus this jacket, would give too much heat for full power operation, so there is a small throttle in the exhaust line to the carbureter jacket which is interconnected with the main throttle but in reverse direction so that opening the main throttle closes the exhaust throttle. This gives the heat desired for part throttle running, but prevents too much heat from being applied at full-power operation.

The Hot Spot Idea

The Nash is perhaps the best example of the air temperature control for heavy fuels. The other system is quite different and functions in accordance with the following theory: The trouble with heavy fuels is the presence of actual liquid in the cylinders. This presence of liquid is due either to condensation in the manifold *after* a proper mixture has been been made in the carbureter, or to inability of the carbureter to break up the fuel fine enough to vaporize it all. Hence if we can catch any liquid in the manifold and reconvert it into vapor before it enters the cylinders we have conquered the difficulty.

Even cold air will carry the bulk of the fuel as vapor, it is only a proportion which condenses or remains liquid. The cool air can be made to take up the liquid fraction if the latter is heated strongly enough and can hold the whole charge in suspension for the short time before it passes into the cylinder and is burned. Now liquid particles moving in an air stream have appreciable momentum, and if the direction of flow of the air is changed, as by passing round a bend in the manifold, the liquid globules will tend to continue in a straight path till they strike the walls of the passage. If, then, the point on the manifold where the globules would hit is strongly heated, the liquid will be "boiled off" directly it touches the metal.

To be effective, such a "hot spot" must be at a point on the way from carbureter to cylinders where the direction of flow changes, but it need not be larger than just big enough to cover the area where liquid could be deposited. This means that a little piece of the manifold may be very hot so as to boil off all condensed liquid, and still be so small that it cannot heat the main body of the air appreciably is in the short time the latter takes to pass the spot. This assures that the engine is able to draw in the full weight of air at all times and thus no power loss results.

One of the best examples of hot spot design is seen on the new army truck engine. Here the intake manifold is external, but short. From the carbureter it rises up straight to a point well above the valve ports in the cylinder blocks. At the top of the rise it touches the exhaust pipe in a method described below, and it here divides, the two branches sweeping downward quite clear of the exhaust manifold.

The sketch shows the section where the intake and exhaust manifolds are joined. Actually about three inches of length of intake passage is exposed to the exhaust within the exhaust manifold, where it is hottest. The rest of the intake is exposed, and in use it is noticed that while the middle point of the manifold cannot be fingered the branches near the cylinders can be held in the hand without discomfort.

This example is an extreme of hot-spot construction. In other cases the hot spots are smaller, and there are

Major Points of Fuel Problem

1—*Heavy fuel does most damage to cold engines*

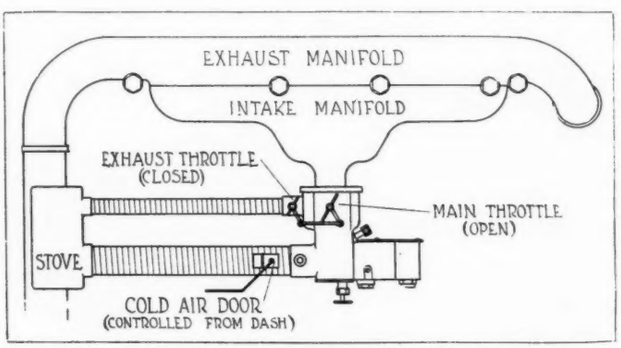
2—*Vaporizing device must warm up instantly*

3—*Present systems, mostly too slow, causing—*

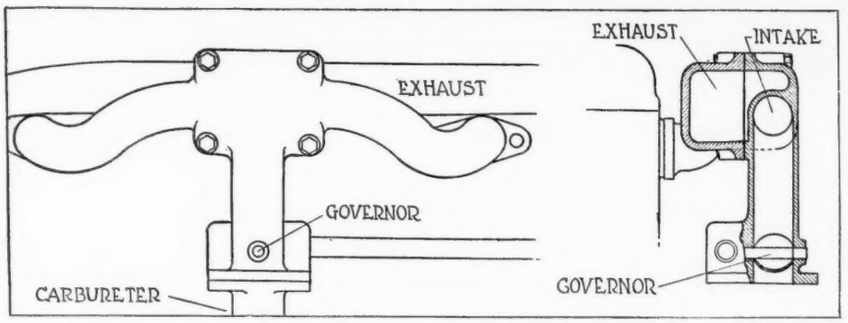
4—*Severe damage to engine in first five minutes*

5—*Heat controls must become automatic*

6—*Vaporizing and engine cooling one problem*



Nash system of applying heat to fuel



Fuel heating arrangement on war truck

some instances where a small hot spot is used in conjunction with a heated air supply to the carbureter. Variable hot spots are also being tried experimentally, that is some sort of control which will vary either the size or the temperature of the spot.

It is impossible to regard any of the heavy fuel handling systems as final. None of them are capable of taking care of kerosene efficiently, so they have limitations. Some of them will handle present-day commercial gasoline well, but we cannot foretell what sort of fuels we will be getting a year from now. The variability of the fuel is the worst feature of the problem. If all gasolines were the same. and were to remain the same, it would be much easier to provide for them. Meanwhile, a system which will handle distillate will overheat gasoline and underheat kerosene. If fuels go much heavier on the average there will have to be changes beyond hot spots and hot-air stoves. Both these devices may be embodied in future developments, but there will be something else as well. What is wanted, and what is not yet discovered, is a simple method of supplying a quantity of heat which will vary *automatically* with every change of engine speed or load and every variation of atmospheric temperature.

Many of our engineers are trying to find a solution which is a job not for carbureter men or engine men but for both together.

Cooling Links Up With Vaporization

Cylinder Temperature Should Be Constant and High From Instant of Starting Onward Throughout Use of Engine

WE are only at the threshold of thermostatic control. A great number of manufacturers have not even begun to experiment with it, and those who have, have had varying results. A vote taken among those who have tried it shows that while not universally successful, it is well worthy of further experiment and development. It is, of course, recognized that a truck operating upon the heated sands of New Mexico will have a different set of conditions to meet than one operating in even the moderately cold cities of this country, such as St. Paul or Duluth. Yet when these trucks go out from the factories they must be fitted with standard equipment so designed that it will be able to meet these varying conditions. This can only be done if the control of the amount of hot air which enters the jacketing space is placed in the hands of the operator or is made automatic.

Coping with Oil Dilution

The problem of crankcase oil dilution is one which everyone has to cope with whether they recognize the fact or not. It is going to be a serious question this winter and one which must be recognized immediately or it is going to cost truck owners thousands of dollars in upkeep expense. The first few revolutions of the engine before the fuel and air have been preheated draw into the cylinder a spray of unvaporized fuel. Only a certain percentage of this is consumed in the early stages of combustion. If it were all consumed the engine would immediately deliver its full torque, but of course this is not the case. The remaining fuel which is in a liquid condition seeps past the piston rings, cutting the lubricating film on its way, finally entering the crankcase with the diluting effect noted. This leaves the piston rings operating on a dry cylinder wall until oil is again fed to the surface, and, if carried on far enough, leads to a quality of lubricant in the crankcase which is not sufficiently good to take adequate care of the main bearings, giving rapid deterioration of these.

There is only one way to cope with this situation, and that is to put into the cylinder on the first explosion, if possible, a completely vaporized mixture, *and* to prevent condensation *in* the cylinder. If this is impossible the nearest thing that can be done toward it is to shorten the warming-up time. The objection to the water-jacket method of heating the carbureter is partly due to the fact that it takes too long to warm up. With the exhaust-jacketed type the first few explosions go a long way toward raising the temperature of the intake passages to the proper point. But in addition to this we may come to the point where it becomes commercially advantageous to never permit the truck engine to become cold. There are cheap methods of keeping the engine continually warm by electric-heat apparatus, or even gasoline stoves, which cost but a few cents an hour, and if the problem of crankcase dilution grows to a much greater extent than it has in the past two years, it may be necessary to utilize some such contrivance.

It is safe to say that any truck which a year from now has the present conventional cooling system for its engine will be a back number.

This is despite the fact that hardly any trucks to-day have any control for either water or air flow. Cooling systems are still designed to take care of maximum summer heat, which means that for eleven months of the year the engines are over-cooled.

Whatever precautions are taken to insure the manufacture of a good gaseous mixture in the manifold it will not burn efficiently in the cylinders unless the engine is adequately warm.

Despite these facts, nearly all truck engineers are strongly in favor of an automatic engine temperature control and many are experimenting. There are two sys-

tems. The Packard thermostat prevents the flow of water from the engine to the radiator until a certain temperature is reached; previous to which the water in the jackets merely circulates around the cylinders. The other method is to have a series of adjustable shutters in front of the radiator as on Hudson cars, making them controllable either by a thermostat or by hand from the dashboard.

The advantage of the Packard system is that the small body of water in the cylinders warms up quickly. The drawback is that the radiator keeps abnormally cool and so a strong anti-freeze solution is necessary.

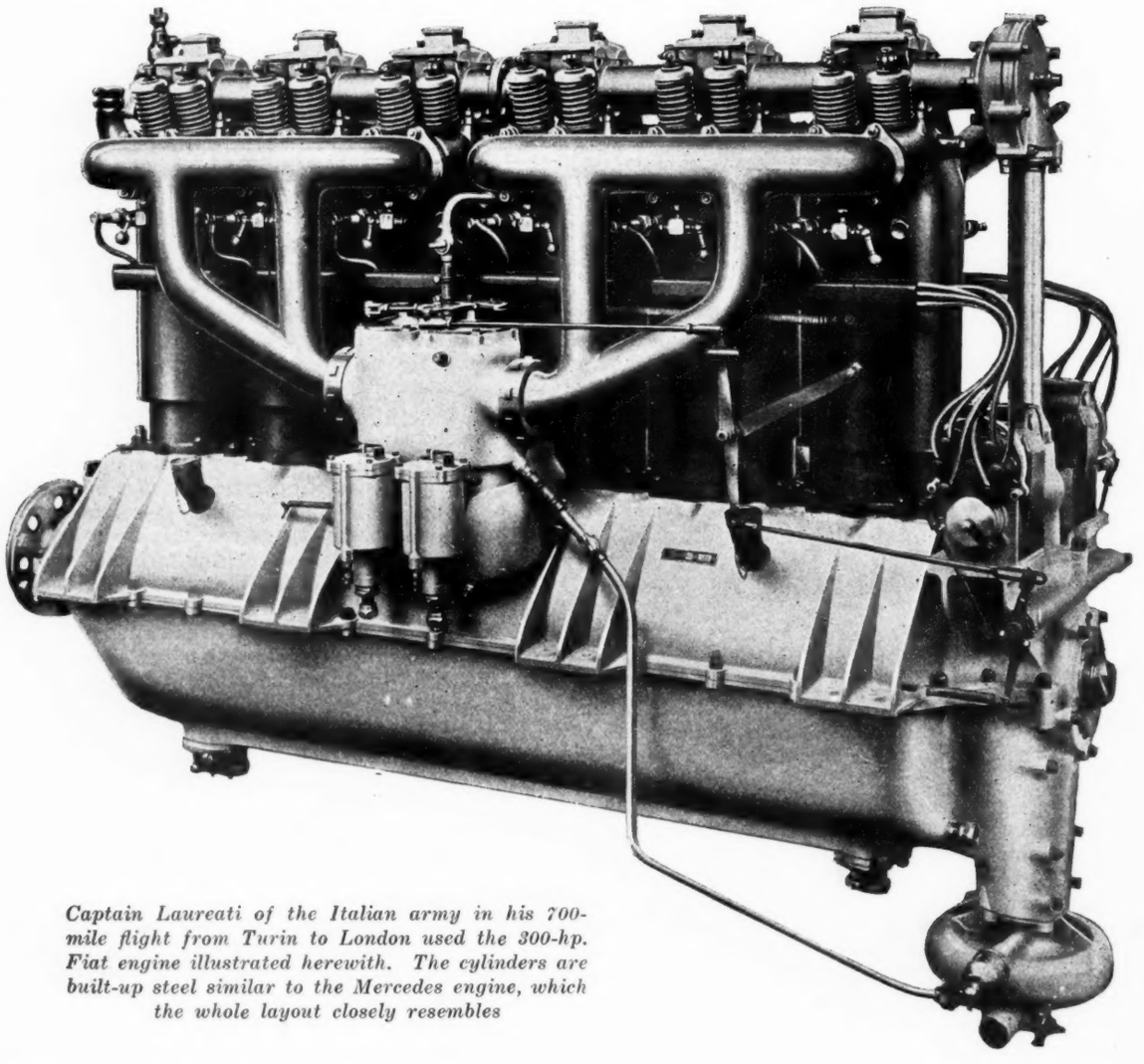
The air shutter control takes longer to heat up, but all the water is kept warm and anti-freeze need not be employed.

There is much to be said in favor of the rapid heating up because it is when the engine is cold that condensation of fuel inside the cylinders takes place. Such condensed fuel cuts the lubricant, damages the pistons and cylinder walls, and, by getting into the crankcase, vitiates the oil and endangers the bearings. On the other hand, it is an advantage not to have to use alcohol in the radiator, because the expensive liquid is always boiled off after a while, and it is necessary to keep a constant watch on the radiator contents to see that the proportions of water and alcohol are maintained.

Undoubtedly the ideal system would be a combination of both water and air control. Automatic restriction of the water circulation would give the quick warm-up desired, and the air shutter, with either automatic or hand control, would eliminate the need for much anti-freeze. Such duplication sounds complicated, but it need not be, and heavy fuel is going to force upon us some "complications" to counteract its effects.

It is remarkable that nobody among the radiator manufacturers seems to be taking any interest in the matter. It has been suggested more than once that a very simple way of handling the difficulty would be to make a radiator with two or three compartments, so that one or more could be cut off and drained for winter work. Of course, such a radiator would cost more than the plain kind, but the control of cooling has *got* to cost more.

300-Horsepower Fiat Aircraft Engine



Captain Laureati of the Italian army in his 700-mile flight from Turin to London used the 300-hp. Fiat engine illustrated herewith. The cylinders are built-up steel similar to the Mercedes engine, which the whole layout closely resembles

Hotchkiss Drive Almost Universal

Principles of Design for Drive Through Springs Being Appreciated—Pneumatic Tires and Spring Wheels Also Used to Improve Suspension—Increased Speed Main Object of Pneumatics on Large Trucks

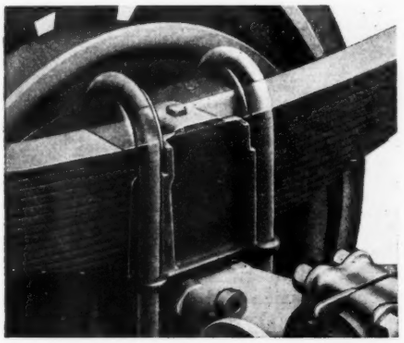
WHILE there have been no radical changes, the suspension of most trucks bearing the 1918 date is considerably better than ever before. The science of spring design is succeeding the "art" thereof, with great benefit to engineering. Hotchkiss drive looks like being the ultimate form of truck propulsion. It has gained many adherents during the year and very few users of it have fallen away. In some cases there is no question but that experiments made with it have failed through the engineer's lack of appreciation of the first principles of the drive layout. In some other cases where radius or torque rods are used their retention is undoubtedly due to habit. Where the extra cost of radius rods is only a small item in the total price of the truck, there is not a very great incentive to the manufacturer to drop them. Every engineer hesitates to abandon a construction which has been giving satisfaction.

Hotchkiss Drive Difficult Design

It is easier to make a good drive with radius rods and a torque stay, and till recently only a very few engineers knew how to lay out Hotchkiss drive. Now that chassis builders and spring makers both have gathered much experience, the Hotchkiss system has at last a chance to demonstrate on a large scale its inherent good points.

There are two principal points to be remembered in laying out Hotchkiss drive. First, the spring must be nearly flat under load, so that the driving effort is applied lengthwise of the top leaf, the direction of effort lying within the metal instead of across a chord of an arc outside it. If the spring has much camber the drive force running in a straight line from the spring table to the front eye will tend to bend the spring still more. The more nearly the front eye and the center of the spring are in line horizontally, the less is the distorting effect of the driving force.

Second. the brakes must be laid out so that the eyes of the levers on the axle, to which the pull rod yokes are attached, come up into line with the top leaf of the spring. Also the brake cross shaft or equalizer bar on the frame must be in such a position that movement of the spring does not cause variation in the distance between the axle and the equalizer connections.



An excellent example of rigid spring attachment for Hotchkiss drive

Bringing the lever ends on the axle into line with the top leaf of the spring allows the axle to rotate a little, so twisting the spring, without causing a fore-and-aft movement of the levers which might set the brakes. Choosing the proper place for the equalizer connections prevents the brakes being set by changes in the spring camber due to load or road shocks.

There are two main advantages in Hotchkiss drive: It is more yielding than a rigid drive, which cushions shocks on the gears to some slight extent, and it saves a little weight and a little cost. It also does away with joints that would need lubrication. Its drawback is the need for a slightly heavier top leaf on the spring, perhaps on both the top and second leaves.

Another argument brought against it is the liability of a sudden violent shock to unwrap the spring eye. Such a shock as can occur by backing a truck up to a loading platform carelessly. Various devices have been suggested to counteract this tendency, although instances of spring eye failure are very hard to find. One of the precautions is to carry on the second leaf and to make on its front end a second eye of elongated form. Another is to have a leaf above the top leaf which is bent up at the ends and brought to bear upon the back of the eye. Both methods are quite successful, but the plain spring seems to do equally well if it is made of proper material and heat treated in the right way.

Spring Material Better

Spring material generally is getting better. A spring maker will supply several different grades of steel ranging in price from one to three. There will be no difference in the action of the spring whether it be made of the lowest grade or of the highest, but the better the material the longer will the spring last, and the less likely will it be to weaken or break. Manufacturers of trucks are finding that it pays to buy good steel, and some whose limit a couple of years ago would have been, say, 6 cents a pound, are now cheerfully buying a grade which would have cost twice that sum had steel prices remained at their former level and now costs much more than that.

The action of a spring—the softness, that is—depends mainly on the quantity of steel in it. Two springs of equal strength can be made from a few thick leaves or from many thinner ones. The latter will be the heavier spring but will be better acting and will last longer. For this reason there is a slight trend toward more and thinner leaves and there is no doubt that money expended on springs gives very direct return. They are one of the parts of a truck which should be the last to economize upon.

The Place of Pneumatic Tires

Durability engendered by ease of suspension is one of the chief arguments in favor of pneumatic tires for trucks of two-ton capacity or over. Their future must be largely bound up in their price, however, because this is so great that solid tire cost plus the cost of repairs hardly exceeds the pneumatic tire expense alone. If the

(*Continued on page 758*)

New Airplane Standards

British Type of Wheel Approved — Tachometer Drive Cleaned Up—Dope and Varnish Specifications

WASHINGTON, D. C., Oct. 30—Another two-day meeting of the S. A. E. standards committee aircraft division on Sunday and Monday, preceded by a meeting of the sub-committee on wheels on Saturday, has done much to put additional aircraft standards on the records of the Society. The all-important matters of dopes, varnishes and glue have been definitely settled, for the time being at least; it is tolerably certain that the British design of wire wheel for landing gears will be used, a new fine thread screw standard for aircraft work has been elaborated and many other matters have been either disposed of for the present or materially advanced on the way to settlement. The sub-committee meeting on Saturday, which was held at S. A. E. headquarters in the Munsey Building, was well attended and led to a spirited discussion of the whole subject of wire wheels—the design of rim, hub, spokes and nipples, as well as methods of lacing. Airplane and wheel manufacturers desired to see the wheels now being used by the Curtiss Co. and other American airplane manufacturers, but the Signal Corps was strongly in favor of the British design, which it considered to be lighter, and also because of the advantage of using wheels interchangeable with those on British machines.

The meetings on Sunday and Monday, considering that they were meetings of the whole aircraft division, were not so well attended relatively, and a number of subjects on the program, particularly such as related to engines, had to be passed over because none or practically none of the members of the sub-committee were present. These meetings were held at the Bureau of Standards, the large meeting rooms of which in quiet surroundings afford excellent facilities for such meetings, besides which the fact that many of the staff members of the Bureau are on the sub-committees of the aircraft division makes this arrangement particularly convenient.

Approve British Wheel

A meeting of the sub-committee on wheels was held on Saturday at the New Willard Hotel. At the last meeting on Oct. 19, the adoption of the wheels used by the British Air Board had been considered, but in the meantime it had been intimated to members of the committee that the lacing employed in these wheels was covered by a patent, and Mr. Hanks in opening the session asked for information on this point.

The result of the meeting was a decision to recommend to the Aircraft Division for adoption a series of four milimeter sizes of aircraft wheels, exactly the same sizes as now used by the British Aircraft Board, the wheels to have the same form of rim and hub as the British wheels, the spoke lacing not to be specified at the present time and all matters depending upon the type of spoke, spoke accessories and lacing therefore to remain open. The only feature not dependent directly or indirectly upon the form of spoke lacing, in respect to which the proposed wheel is to differ from the British wheel, is the spoke nipple, which, instead of having flats on it for a wrench, will be provided with a screw driver slot, as it can be screwed home much quicker with a screw driver than with a wrench.

The drawings shown herewith are the Goodrich drawings of the Palmer wheel. They show the triple lacing and do not show the screw driver slot.

There was a long discussion before reaching these conclusions.

J. E. Hale, who occupied the chair, pointed out that it was entirely contrary to the policy of the S. A. E. to standardize any patented device. Of course, if the Signal Corps so decided, they could use these wheels without their being recognized as S. A. E. standards. Mr. Diffin suggested that a thorough investigation of the patent situation covering the suggested design be made by the Aircraft Production Board. He said that the Board was prepared to have such a search made and could furnish complete information regarding the subject in about three days. If it was found that the design was covered by the Pugh patent it might be possible to get the owners of the patent to waive their rights pending the duration of the war. Mr. Diffin emphasized the great advantage of having wheels that would be interchangeable with the British wheels.

R. B. Jones of the Curtiss Aeroplane Corp. questioned whether there was any advantage in having wheels that were interchangeable with the British wheels, for the reason that the British were not able to manufacture a sufficient number of wheels to meet their own requirements and consequently could not be depended on to make wheels or parts thereof for use on American machines. He very strongly urged that the 26 by 4 in. wheels as now used on the Curtiss JB-4 model be continued.

Mr. Hale said that the Palmer wheel had been thoroughly worked out and was considered by both the Signal Corps officers and officers of the English air forces in this country, superior to any wheels produced here. Mr. Jones reiterated that production was the greatest need and that it would be disturbed if any radical changes in design were made. He thought that in attempting to standardize airplanes the S. A. E. had not worked along proper lines, as designs should have been selected that were already in extensive use. Contrary to this the proposed series of wheels did not include a single one now in use in this country. Mr. Manly had spent a year in England, where he had picked up a great deal of information concerning wheels, and upon his return to the United States they had worked out a wheel design which had never given any trouble.

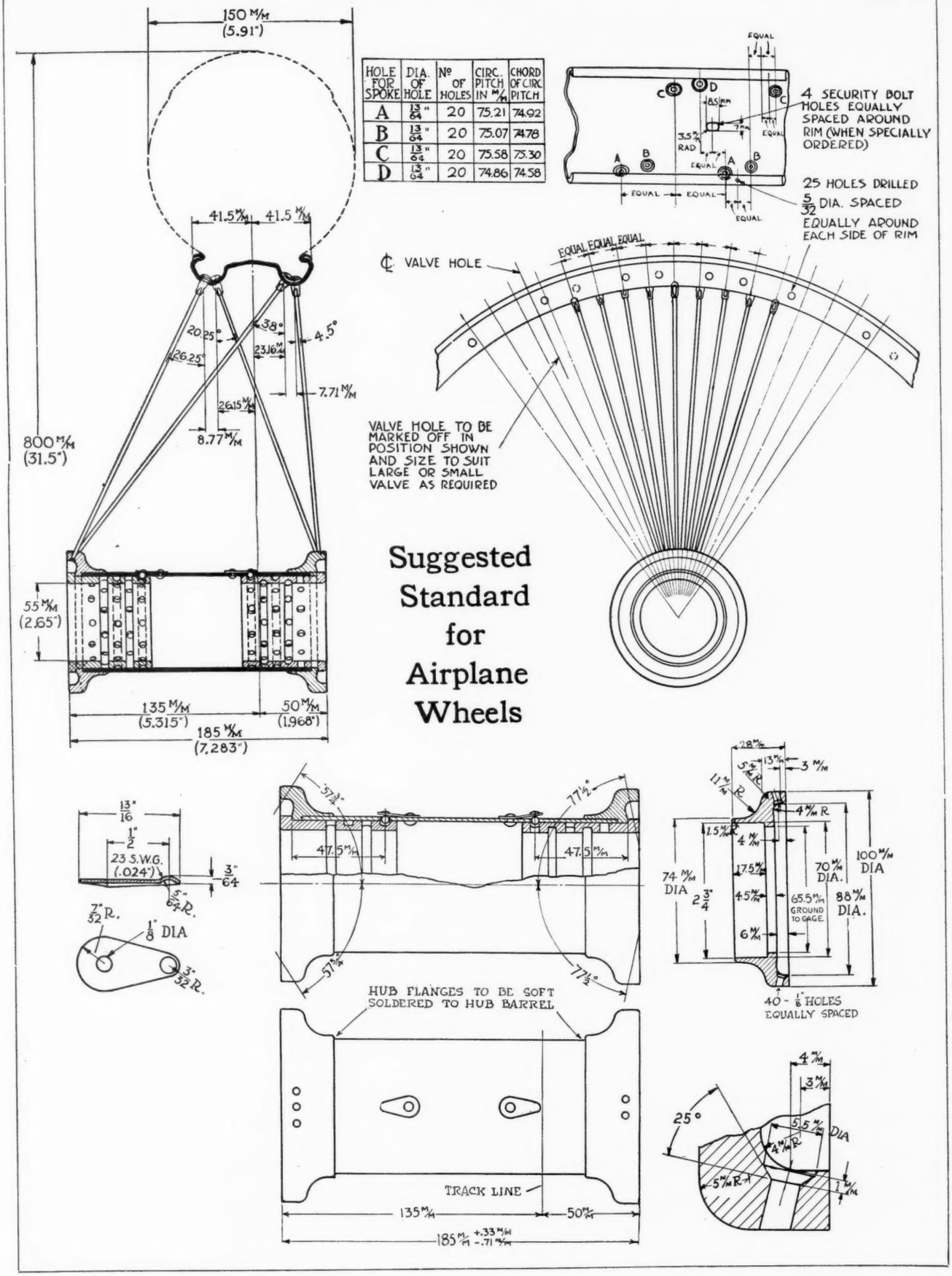
At this point a discussion ensued as to the relative strengths of the Palmer wheel, of which a sample was shown, and the wheel used on the Curtiss JB-4. The 30 by 5 in. Palmer wheel has a radial crushing strength of 9600 lb., while the Curtiss, 26 by 4 in. wheel was said to have a crushing strength of 12,000 to 15,000 lb., but according to Mr. Tew of the Goodrich company the figures are 9600 lb. for the Palmer wheel and 9100 lb. for the Curtiss wheel.

For Fast Machines

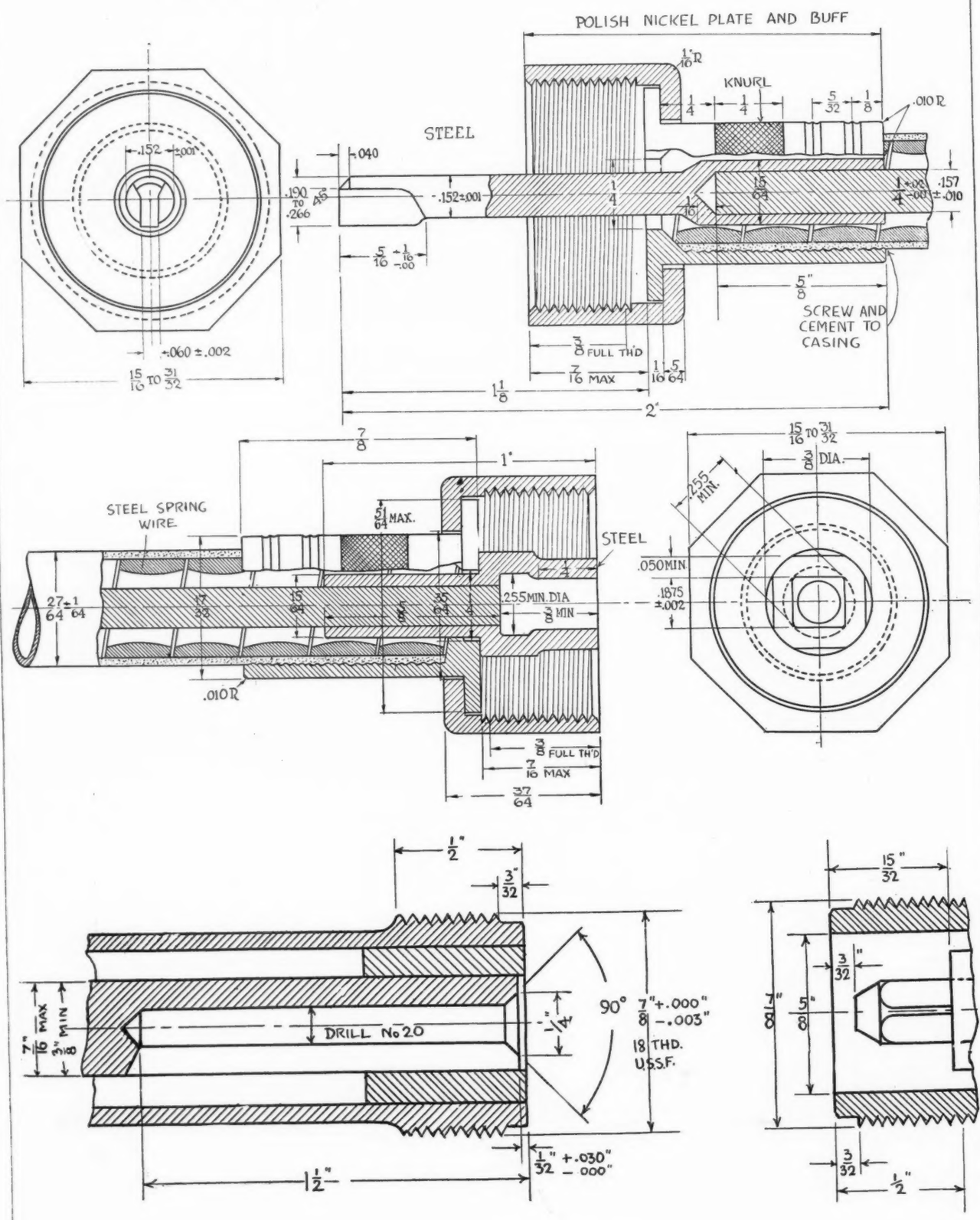
Mr. Jones conceded that for very fast machines the Palmer wheel would be superior, as in its design the tendency of the tires to pull off the rim had been overcome, but he could see no reason for using other than American wheels on training machines. On the Handley-Page, Caproni, Spad, and other powerful foreign machines to be built in this country, the Palmer wheels should be used. Mr. Hanks gave a review of a talk he had had with a French flying officer regarding the subject of wheel standards in France, that they were using a great many different sizes, but that there was a distinct leaning toward the British design.

Mr. Douglas, representing Captain Clark's office, was called upon to place before the Committee the standpoint of the Signal Corps. He said that Captain Clark was very favorably inclined toward the Palmer wheel and tire, which he considered excellent both as regards weight and strength. The uncertainty as to the patent situation had introduced a new factor, but this could probably be taken care of. Some way would be found to get around delay in production, upon which so much stress had been laid. It was the intention to continue the use of the American wheel for training machines. In

Suggested Standard for Airplane Wheels



Standard Tachometer Drive for Airplanes



fact, the production question was not a serious one at all, the question relating to the patent situation being far more important. The Signal Corps considered the Palmer wheel the best design.

Some figures as to the weight of the different wheels were given by different parties. According to Mr. Douglas the 30 by 5 in. wheel as used on the Curtiss training machine weighs only 5.34 lb., but according to one speaker a complete 26 by 4 in. wheel made in this country weighs 1 lb. more than the 700 by 100 mm. English wheel.

J. E. Hale again stated that it was impossible for the S. A. E. to standardize a patented article and nothing could be done with the British design unless any patent rights on it were waived for the duration of the war. If not and the Signal Corps still wanted the wheel, probably the best plan for the S. A. E. would be not to standardize anything, but merely endeavor to help the Signal Corps get the wheel. In connection with the peculiar shape of the rim of the Palmer wheel, which is described as having a two gutter effect, it was pointed out that this feature was covered in a patent issued to T. B. Jeffery in 1892, which patent expired a long time ago. The only feature of the wheel which is believed to be covered by patent is the so-called triple lacing, which is described in U. S. patent No. 1,047,702 issued to J. V. Pugh on Dec. 17, 1912. If it is found that the lacing used in the present British design comes under the claims of this patent, an attempt may be made to induce the owners of the patent to waive their rights pending the period of the war, in the case of manufacturers producing for the Government, or else a different form of lacing may be used.

Hub Is Offset

An important feature of the Englsh wheel is that the center of the rim is offset from the center of the hub by a considerable amount, the inner edge of the rim being substantially in the same plane as the inner edge of the hub. This makes the wheel very strong against lateral shocks from the outside, which are the most important shocks sustained by aircraft wheels in landing. It is possible to get this offset effect also by means of a double crossed lacing or by means of a double plain lacing. Wheels could thus be manufactured which would interchange with the English wheels without infringing on the Pugh patent. Mr. Ash exhibited a wheel with a double crossed lacing and said that he had found the resistance to lateral shocks substantially the same with double cross lacing and with triple lacing.

Mr. Hanks here reminded the Committee that at the meeting of Oct. 19, it had been decided to adopt the English design as a standard, and that if it was found this could not be done on account of the patent situation, it would be necessary to rescind that decision. He thought, however, that the committee might adopt a series of wheel diameters, a shape of rim, and dimensions for the hub, leaving open for the time being all matters affected by the form of lacing used.

A motion was made by Mr. Douglas of the Signal Corps to the effect that the decision of the Committee at the Oct. 19 meeting to standardize four sizes of rigid wheels and tires—700 by 75 mm., 700 by 100 mm., 750 by 125 mm., and 800 by 150 mm.—should be ratified, but that in view of the uncertainty of the patent situation this decision should be qualified by inserting that all details which are dependent upon the type of spoke, spoke and accessories and lacing used should be left open for final decision until the receipt of information regarding the patent. Furthermore, that the hub sizes corresponding to the different wheels should be as follows: 700 by 75 mm. (the dimensions for this size are at present being revised by the British Air Board, and must therefore remain open); 700 by 100 and 750 by 125 mm. as shown in Goodrich drawing Exp. 1128-C; 800 by 150 mm. as shown in Goodrich Drawing Exp. 1131-C; and finally, that the nipple head should be provided with a slot to be shown in drawings Nos. Exp. 1132-C and Exp. 1129-C.

Informal Meeting Sunday

There was no formal meeting on Sunday but about a score of men gathered at the Bureau of Standards and collected in a number of groups which discussed various subjects that are on the program for standardization.

The spark plug sub-committee worked out a new report, bringing the subject of spark plug shell standardization to a more advanced stage. In this it is recommended that a 1 in. hex. be adopted although a few engines in service cannot use this, and in the event of the standardization of this size would have to use a non-standard size. Where the threads are chased they are to be made in accordance with a drawing accompanying the report, which is the same as one published in AUTOMOBILE AND AUTOMOTIVE INDUSTRIES four weeks ago, except for the limits on the diameter of the neck, which are set at 0.625 and 0.664 in. The gasket seat flange is to be 15/16 in. in diameter and the minimum distance from the bottom of the thread chanfer to the bottom of the shell is to be 3/32 in. Other dimensions at this point are to be in accordance with the drawing submitted. The one point which proved to be a stumbling block was the subject of thread tolerances. It had been proposed to adopt the tolerances specified by the British Engineering Standards Committee, but some of the members objected to this on the ground that they were contrary to practice in this country in that the maximum diameter for the tapped hole was several thousandths of an inch greater than the nominal size. It was assured that a standard tap will generally cut a thread 0.001 in. large when new, owing to the slight bur on it resulting from the last grinding. It will soon cut a thread of absolutely correct diameter, however, and will gradually cut smaller and smaller as the cutting edges wear. While it is possible to make taps to cut threads of any diameter it would be logical to make them in accordance with the established standard. The necessary tolerance between the male and female threads can easily be provided for in cutting or rolling the male thread on the plug shell. As the tolerance of the different spark plug makers do not agree it was the intention of the sub-committee to circularize the spark plug makers and defer a final decision, but Mr. Manly, who, as chairman of the Aeronautical Division, is ex-officio a member of this sub-committee, impressed upon the members the imperative need of settling the matter and got them to agree to the British limits, so those were inserted in the report.

Tachometer Drive

In the tachometer drive specification as formulated at the previous meeting a whipcord braid impregnated to prevent oil leakage was specified, but Mr. Wright of the Stewart-Warner Speedometer Corp., asserted that they had found it impossible to get this whipcord braiding. He offered an aluminum covering which he claimed to be equally satisfactory. It was therefore agreed to revise the specifications on this point so as to afford a little more latitude to manufacturers. The drive specifications recommended read as follows:

1—The upper or instrument end of the shaft has a squared socket, made integral with a shoulder which forms a thrust bearing.

2—The lower or engine end is finished with a cylindrical end with a single integral key.

3—The casing is to be of flexible metallic tubing, covered with whipcord braid and impregnated to prevent oil leakage, similar to sample, or an equivalent covering provided it is equally oil-tight, non-stretching and light. The outside diameter of casing, over braid, to be approximately 7/16 in.; the inside diameter of casing to be approximately ¼ in. The ends of the casing are finished alike as shown in detailed sketches. The screw-threaded sockets covering the whipcord braid are screwed in place and set with shellac or other suitable material to form an oil-tight and permanent connection.

4—The shaft end at the engine is drilled and slotted to fit the tachometer shaft end, allowing for end-play of at least 1 in. More play than this may be required where the driveshaft is more than 6 ft. in length, the amounts to be determined experimentally.

5—Drive shaft to be of helical wire wound construction, with core wires.

6—The tachometer spindle is finished square to fit the square socket on the drive shaft.

7—Drive shaft will rotate at one-half crankshaft speed.

8—Size and contour of exterior circumference of end nuts optional, but 15/18 in. octagon recommended.

9—Dimension and details are given on accompanying drawing.

(*To be continued*)

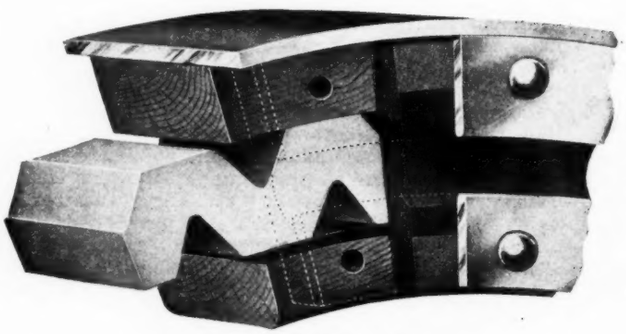
Hotchkiss Drive Almost Universal

(*Continued from page* 753)

pneumatic tire eliminated *all* the repair expense the total cost of running a truck would not be much decreased. Where the big pneumatic appears likely to score most is by permitting a higher speed of operation and so allowing the truck to cover more ground in a day. For example, a truck operating on ten-mile round trips taking half an hour per trip for loading and unloading could make seven journeys between 8 a. m. and 6:30 p. m., if its average running speed was 10 m.p.h. Raise the average speed to 15 m.p.h. and nine loads a day could be hauled. The labor cost remains unchanged, the capital charges on the truck are not altered so the cost per load handled might easily be reduced by the increased speed of working.

Truck makers in general are inclined to be skeptical of the big pneumatic, but it must remain an unproven thing. In another year or two we shall have more evidence on which to judge it, because it is going to be tried out on a large scale. One petty trouble which is holding it back is the fact that no garage tire pump will inflate to the 150-pound per square inch necessary, but the engine-driven pump makers are taking care of this. Kellog is making a special pump for the Signal Corps trucks which is said to be able to fully inflate a 7-inch tire in less than 5 minutes.

Another difficulty is how to carry a spare. Probably most trucks running on a regular schedule would not do so. The tires are practically unpuncturable, and a blowout would likely mean the end of the casing in any event.



Section of Sewell wheel

A different shock-reducing device which has a great vogue in certain districts is the Sewell cushion wheel. In this the actual wheel is smaller in diameter than usual and is surrounded either by a ring of hollow rubber rollers or by a thick band of deeply corrugated rubber. Over this fits the rim with a conventional solid tire. The outer rim and the felloe band of the wheel are connected by rubber rings which are held in place by steel rings and bolts, inclosing the cushion member completely. Of course, the resiliency is not so great as that of a pneumatic, but it is considerably greater than that of a plain solid tire.

Philadelphia Section S. A. E. Discusses Springs

PHILADELPHIA, Oct. 26—Rusty springs are better for very rough roads and high speed; but for moderate speeds on smooth roads, such as city pavements, well-lubricated springs are best. This, in brief, is the conclusion reached at the monthly meeting of the Pennsylvania Section of the Society of Automotive Engineers, held here last night. About 30 engineers attended the session, which is the first of a series that will take up "The Elements of Car Construction Affecting Easy Riding." Subsequent meetings will consider the relation of upholstery to this problem, wheels and tires and shock absorbers.

In opening the discussion, Walter C. Keyes, chief engineer of the Standard Parts Co., Cleveland, stated that there is no outstanding superiority in the riding qualities of any particular type of spring. "If any one type had proven consistently superior," he said, "it would have been adopted by car makers, just as the bevel gear has."

The three factors affecting riding comfort are (1) tires, which absorb small vibrations and bumps of perhaps 2 or 3 in.; (2) springs, which absorb all the larger shocks; and (3) upholstery, which absorbs the multitude of small shocks and vibrations.

The consensus of opinion of the meeting appeared to be that no spring as yet designed realizes the ideal; that regardless of type, elliptic, semi-elliptic, cantilever, platform, or otherwise, the spring, unaided, is not capable of giving that degree of riding comfort which may be considered ideal.

Rusty springs, it was pointed out, materially aid in damping out recoil because of the extra friction between the leaves. This friction, however, also acts to stiffen the spring and therefore cannot be looked upon as a solution of the problem. It was the sense of the meeting that a spring should be as soft as possible in order to absorb and not transmit road shocks, and damping action should operate only on the recoil.

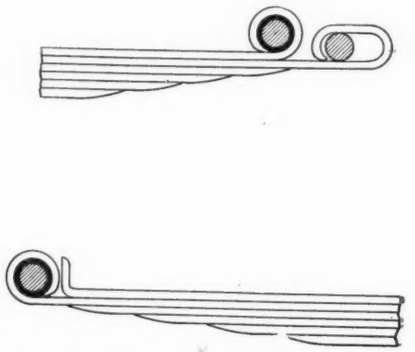
John Wilkinson, vice-president of the H. H. Franklin Mfg. Co., strongly advocated elliptic springs as being the logical type. The only disadvantage of this type his company had experienced was due to the rather longer degree of slip necessary in the universals. Elliptic springs permit a certain amount of side sway, but this, he said, is desirable for easy riding to prevent passengers being thrown violently from side to side on a bad road.

It was Wilkinson who brought up the question of rust improving riding qualities. It was his experience that an old car always rides better than a new one, and in order to make the new car approximate the old in riding comfort a plan had been worked out to enamel between the leaves of the springs to increase the damping action. This, he said, had worked out well.

Wilkinson stated that the less the deflection of a spring per inch the greater would be the riding comfort. He is at present using 160 lbs. to the in. in open cars and 210 lb. in closed cars; the clearance with five passengers is 5 in.

Keys illustrated his talk with a series of lantern slides from photographs made at night to demonstrate spring action. These showed a series of wavy lines made by small lamps in various places on the car as it was driven in front of the camera. A number of different makes of cars were tested under varying loading and speed conditions over a standard bump.

At low speeds —3 to 10 m.p.h.— movement of the car body was considerable; this decreased as the speed was increased up to 20 m.p.h., which appeared to be the best speed for greatest riding comfort, regardless of make of car or loading. Above 20 m.p.h. and up to 30 m.p.h. body movement increased.



Double spring eye and extra top leaf systems strengthening eye for Hotchkiss drive

Chassis Flexibility Studied

Frame Design Changing in Detail—Midships Gearbox Gaining in Favor—Much Discussion on Engine Mounting—Large Tubular Driveshafts Eliminate Whip

FLEXIBILITY in frame construction is sought by every truck maker. The fewer the junctions and brackets the more even the elasticity of the frame members. Lateral rigidity is desirable at the front and rear near the places where the springs attach, road shocks come first to the springs and then to the spring brackets, and they should be distributed thence over as much frame as possible. It is not good for a shock reaching a spring bracket to have nothing but a bit of side rail to carry it on. For this reason it is usual to find a cross member near the front brackets of the rear springs and more manufacturers are tying together the brackets on opposite sides of the frame, so that the twisting of the channel due to the shock is partly transferred to the opposite side and is not all taken by one rail. For this purpose there is no better method than the placing of a bar, or, still better, a stout tube, right across the frame from side to side, the ends of the tube socketing in the spring brackets. The idea of this is really to make the rear end of the frame a platform which will support the load above it somewhat as the bogie carriage of a railroad car is a rigid unit beneath its load.

More Pressed Steel Frames

There are now more truck frames of pressed steel than of structural steel. This is rather an unexpected development, since the difference in weight is not very great, and the advantage of structural steel is that wheelbases of any length can be built without having special presses set up for each. The structural steel comes in any lengths, and costs the same per foot however long it is.

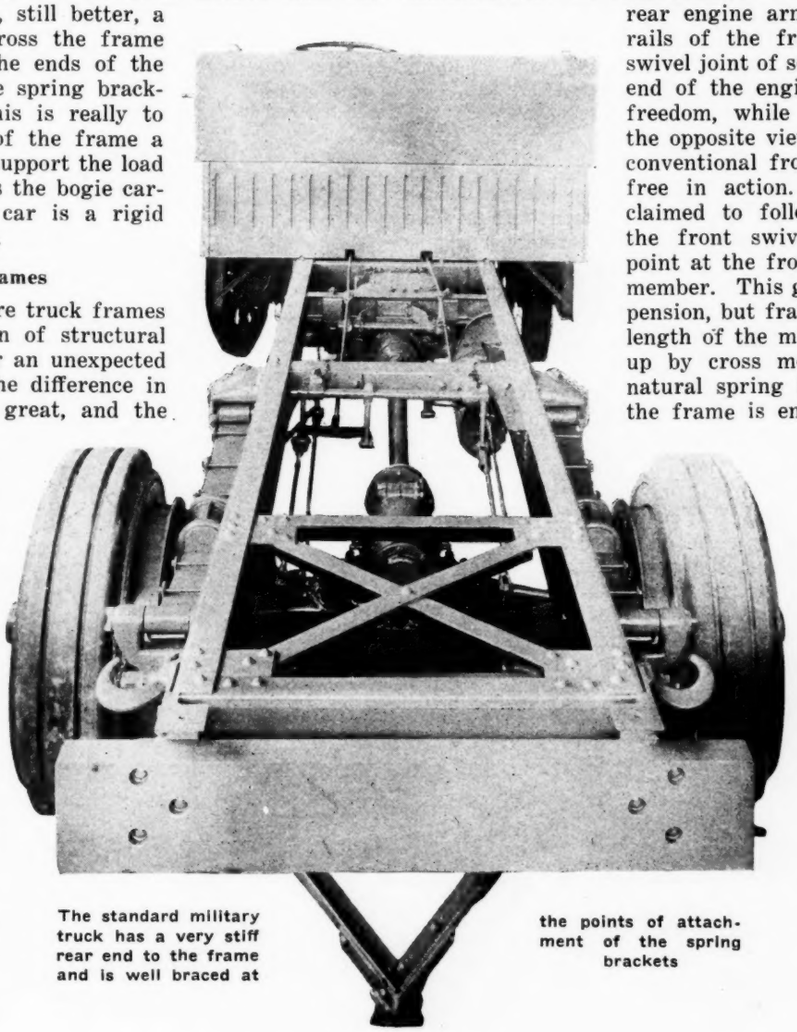
None the less, it *is* possible to save weight by using pressings, owing to the ability given to taper each end. Most of the frame makers will press different lengths cheaply if the front end and rear end of the rail are not altered, but merely the length of the parallel middle portion varies, because the dies are made in sections, and an extra middle piece can be inserted without much trouble.

More noticeable is the endeavor to have as few frame attachments as possible and to make one rivet do the work which formerly required two. The reason for this is, firstly, that holes in the frame weaken it, and, secondly, that the presence of stiff brackets closely secured to the side rail stiffen it at the point of attachment and so localize stresses due to weaving.

Engine Support A Puzzle

Engine support is a much-discussed detail. There is general agreement that some three-point system is the best, but that is only part of the story. Some engineers maintain that the usual method of bolting down the two rear engine arms solid to the side rails of the frames and having a swivel joint of some sort at the front end of the engine gives insufficient freedom, while others take exactly the opposite view, claiming that the conventional front-end swivel is too free in action. Good results are claimed to follow on taking away the front swivel and bolting one point at the front rigidly to a cross member. This gives three-point suspension, but frame weave within the length of the motor has to be taken up by cross member weave. The natural spring in the front end of the frame is enough to prevent severe stresses being put on the crankcase, and the absence of an actual swivel in front holds the engine more stiffly against torque reaction. The idea is, if the engine is freely swiveled in front the driving effort of an explosion in the front cylinder has to be transmitted through the crankcase to the rear arms before it gets to the frame; whereas, if the front point is a rigid bolting, the stress goes to the frame direct.

Others are try-



The standard military truck has a very stiff rear end to the frame and is well braced at the points of attachment of the spring brackets

ing swivel supports on the rear arms as well as in front, as, for instance, the Diamond T suspension illustrated. With such a layout, the torque reaction must all go to the rear arms, but no frame distortion can by any possibility put a stress upon the crankcase. More massive engine arms and stiffer crankcases are also coming into vogue, and it is most probable that this will increase the efficiency of the conventional mounting. Putting the engine rigidly in a sub-frame, which is in turn three point supported in the main frame, as on the Pierce Arrow, is excellent practice but it is quite expensive.

Midship Gearset Gaining

Together with the closer study of frame construction is the position of the transmission and the nature of the driveshaft from the gearset to the axle. There is a growing idea that unit power plants should be limited in total size and weight; that it is better on large trucks to use the midships position for the gear. This is partly because the weight is better distributed and partly because it enables the drive to be divided. If the gearset is very close to the engine, as it must be in unit designs, the propeller shaft becomes very long on a large truck of big wheelbase. This has led many manufacturers to divide the propeller shaft into two sections and to mount a middle bearing on the frame somewhere between transmission and axle. While this eliminates propeller shaft whipping, it adds two more universal joints and an extra bearing plus the cross member to carry the latter. By shifting the transmission back the divided shaft can be avoided and the extra bearing eliminated, only the four universal joints remaining as against the two necessary with a unit power plant on a short chassis.

Up to considerable lengths of wheelbase whipping of the driveshaft can be overcome by making it of a large diameter tube. Such a tube need not be heavy and can be extremely rigid; it costs a little more than a solid shaft, but less than the divided construction. There is reason to anticipate an increase in the use of tubes for driveshafts owing to the success reported by those who have tried them out this year.

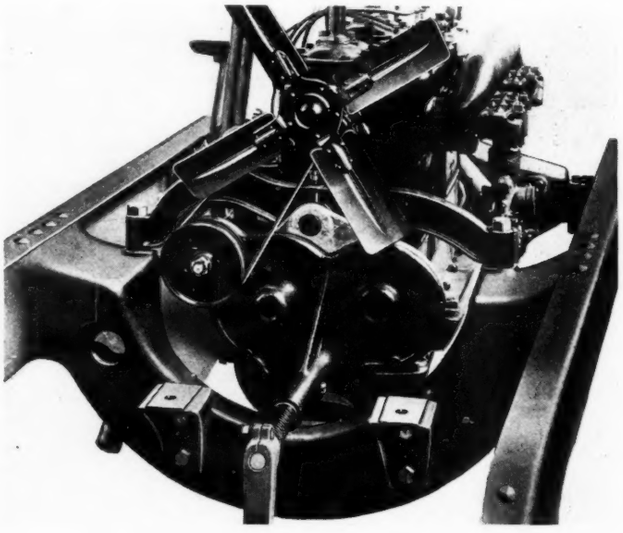
Fabric Joints Come Slowly

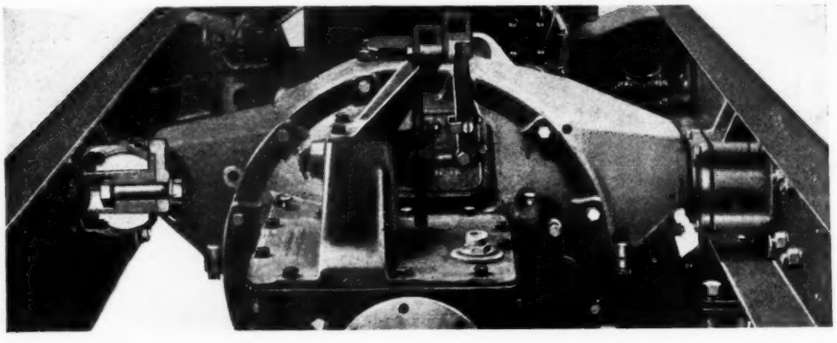
Universal joints themselves have not shown much change. The flexible fabric disk joint which is theoretically ideal, since it needs no lubrication or attention, has gained a little ground, but there have been troubles with it. It seems likely that this is one of the things that one has to learn how to use. For example, the disk joint is not given a fair chance when fitted on a drive where there is permanent angularity; the drive should normally be straight. Also the layout of the springs should be such that there is little telescopic action as the frame rises and falls. Such sliding may be as little as half an inch or as much as three inches. according to the spring design. Yet another thing that makes matters difficult for the disk is that it does best when of the largest possible diameter and engineers have become so accustomed to the small size of metal joints that anything bigger is hard to accommodate on a chassis.

With the midships gearbox the flexible disk is often used between engine and transmission, and seems to be doing excellently. Most truck builders are trying it out on the final drive and it is too early yet to say what the ultimate result will be. The petty troubles such as tearing out at the bolt holes and lack of concentricity are being overcome slowly but surely.

Glossary of Aviation Terms

FIRST LIEUTENANT VICTOR W. PAGE, F.S., S.C., U.S.R., and First Lieutenant Paul Montariol of the French Flying Corps, have collaborated in the production of an English-French and French-English Glossary of Aviation Terms which is published by the Norman W. Henley Publishing Co., New York, at $1. It contains lists of common aeronautical terms in English with French equivalents, and in French with English equivalents, so it is equally well adapted to the use of English and of French speaking aviators. Each section is divided into four parts, viz., flying field terms, the airplane and its parts, engine parts, and tools and shop terms. There are a number of illustrations in the book, of airplanes, airplane parts and engines, which have the names of all parts written in in both English and French. It is intended that this book be used by those interested in aviation who may have overseas service, to supplement the usual French-English phrase books which contain no aviation terms. The book is printed in large type on good paper and well bound.





Front and rear trunnion mounting of Diamond-T engine giving perfect three-point flexibility to the motor

Rubber Companies Co-operate

Era of Secrets and Mysteries Ended—Tires Are Highest Grade Rubber Product—Hints on Estimating Quality of Rubber Articles

DETROIT, Oct. 23—At a meeting of the Detroit Branch of the National Association of Purchasing Agents held last night George Reeves, vice-president of the Dryden Rubber Mfg. Co., Chicago, gave a talk on the latest developments in rubber manufacture. The significant feature of his talk was his statement of the fact that rubber companies are at last abandoning their policy of mystery and joining the other industries in presenting the facts they know in a more co-operative rather than a competitive spirit. Mr. Reeves spoke of the increase in plantation rubber during the past 3½ years, which has greatly added to the supply. According to the latest statistics during the year 1916, the wild rubber used amounted to 50,000 tons, while the cultivated rubber amounted to 150,000 tons. In other words, there was three times as much cultivated rubber used as wild, while in 1913 the percentages were even.

Not only has the plantation rubber greatly increased the available supply, but there is less loss due to the cleanliness in handling the crude so that the impurities, which are 16 to 18 per cent in the wild rubber, are now 1 per cent in plantation rubber. The increased supply, together with the improved methods of handling, has put the cost of crude at a lower point than it has been for some time, the price now being 40 cents a lb., whereas in times past it has been as high as $3.00.

200,000 Tons Annual Increase

The amount of compounding that is done is quite evident when the great amount of rubber goods produced is compared with the fact that there are only 200,000 tons of crude added to the world's supply in a year, and it is an interesting fact that many of the ingredients which are added in the compounding processes not only increase the volume of the products but actually are beneficial to it.

The rubbers in commercial use contain a high percentage of oxide of zinc. Due to the shortage of this oxide which has grown during the past two years, the black tread tire has increased. The white tire requires a very high percentage of oxide of zinc. Mr. Reeves summed up the situation in the epigram "All that stretches is not rubber," and he mentioned many of the substitutes which are used in the production of the cheaper grades of rubber goods. Asphaltum, mineral rubber compounds, etc., are used to a degree which varies inversely with the cost of the finished material. Some of the filling substances are used to merely increase the bulk of the product, while others are used to impart definite qualities to the finished articles. For instance, in the rubber shoe sole a certain amount of fabric is added to give the stitching strength. An ingredient which was formerly used to a large extent, but which is no longer employed by many concerns, is corn oil. This has the quality of imparting lightness to the product, due to the low specific gravity of the corn oil, and it produces one of the few inferior rubber products which float.

Meaning of Bloom

The difference between blooming rubber and non-blooming is that the blooming shows a gray roughness or a whitish streak on the surface when it is scratched. This is generally due to excessive sulphur. It is the sulphur which puts the life into the rubber and gives it the quality of stretching, but when there is more sulphur added to the rubber than is necessary to effect a cure the excessive sulphur will cause the rubber to deteriorate.

To secure a non-blooming rubber, black or red is generally employed and rarely white. It is simply a question of sulphur content, so that after vulcanizing no free sulphur will exist in the product, as it will eventually heat it up.

It was once thought that red rubber was best. The red rubber is secured by using antimony as a curing material and also as coloring matter. The antimony carries a certain amount of free sulphur, and at one time the quantity thereof varied considerably, with the result that even the red rubbers, which were thought to be best, varied in quality. It is now possible to secure much more stable compounds of antimony containing 15 per cent sulphur, which cures and colors also, producing a non-blooming red article of very fine quality.

Mr. Reeves described some of the machines and processes which are in common use in rubber factories, mentioning particularly the mills, composed of two parallel, horizontal rollers, one traveling at a greater speed than another; the calenders having three rollers, one mounted above the other; the tubing machines which extrude by means of worms forcing the plastic material through dies; such things as tubular pieces and forms similar to those used in baby carriage tires. The construction of the hollow mill rollers was explained, Mr. Reeves telling how they are piped so that either cold or hot water can be running through them to take care of different conditions.

It is very important to accurately calender the tires in order to insure that each ply of material has the same thickness and the tires are turned out in exactly the same weight for each tire. If too much material is put into one ply in the tire this material will buckle, giving a factory second, or if it is not detected, a tire which will soon blow out under ordinary road stresses.

Use of Scrap

The uses of the scrap products of rubber are highly important. Owing to the fact that very high-grade rubber is used in automobile tires, the scrap from tires has a high commercial value. This tire scrap can go in hose or belting and will give excellent results. Each time rubber is used it descends in the scale of quality, so that the scrap from tires will have a much higher commercial value than the scrap from hose or belting, which is lower in the scale.

The reclaiming companies have a regular schedule of values for different kinds of rubber scrap. At the top of the scale is the rubber tire and tube. At the bottom of the scale are such things as mats and matting, which are really not rubber at all. This scrap rubber is sent in carload lots to the reclaiming plants, where it is assorted for different uses. These various kinds of scrap are known as shoddy. The shoddy known as auto shoddy, which comes from the tires, is used by the lower grade of tire manufacturers for the cheaper grade tires. It also forms fine material for mechanical goods. It is useless to state that tires should not contain any scrap rubber, because it is only through the extensive use of shoddy that so many articles of rubber can be used. This will be seen immediately from the comparison of the amount of rubber goods of various kinds produced annually when compared with the small relative amount of crude produced.

Mr. Reeves said that the secrecy of the rubber industry is rapidly passing away. It used to be that an employee of one concern would not be permitted to enter the doors of another concern. Now it is the practice for rubber manufacturers to show one another through their plants.

A rubber tree is tapped when it is about 7 years old. Its life is indefinite. The pure rubber gum when cured elongates eight times its length without breaking or without taking a permanent set.

New Fuel System on Paige

Electric Preheater in Carbureter for Easy Starting and All Air Heated—Valves Rotate on Seats to Reduce Wear

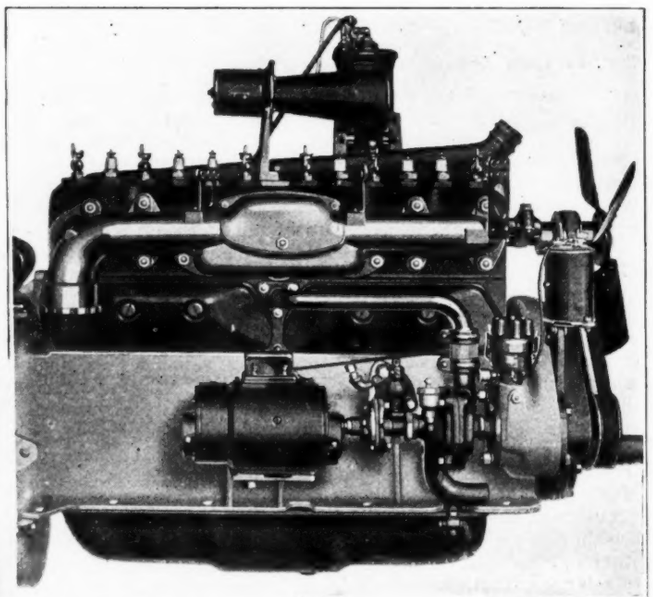
ON the new Paige cars which are just going through, some new provisions are being made to make the car better for winter use. Three features have been added to the engine. One of these preheats the gasoline to make starting easier, another aids in the vaporization of the fuel after it has left the carbureter, and is really an engine manifold feature, and the third is an ingenious addition to the poppet valve to make it self-seating and to eliminate grinding.

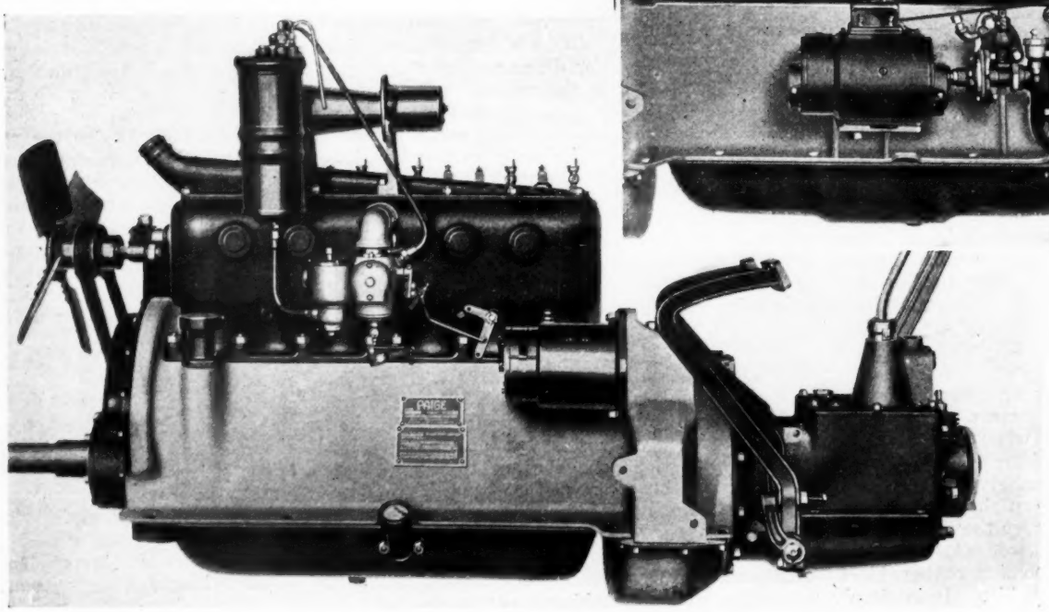
The first of these new arrangements is a heating coil installed in the float chamber of the carbureter, intended to preheat the fuel for quick starting on a cold morning. It consists of a Nikrome wire heating element fully insulated by a lava compound which will stand intense heat. This is inclosed in a copper tube with the ends brazed so that it is impossible for the current to come in direct contact with the gasoline. A control switch is mounted accessible to the driver, so that it is possible to readily throw the switch and preheat the gasoline, raising the fuel to the proper vaporizing point in less than one minute.

Tests made by the engineering department of the Paige company show that in cold weather the heater requires about 32 amp. for 30 sec., this being sufficient to heat the gasoline to a vaporizing point where one application of the starter will start the engine under normal conditions. This, as compared with an equal length of cranking at 90 amp., with the starting motor, is considerably easier on the battery.

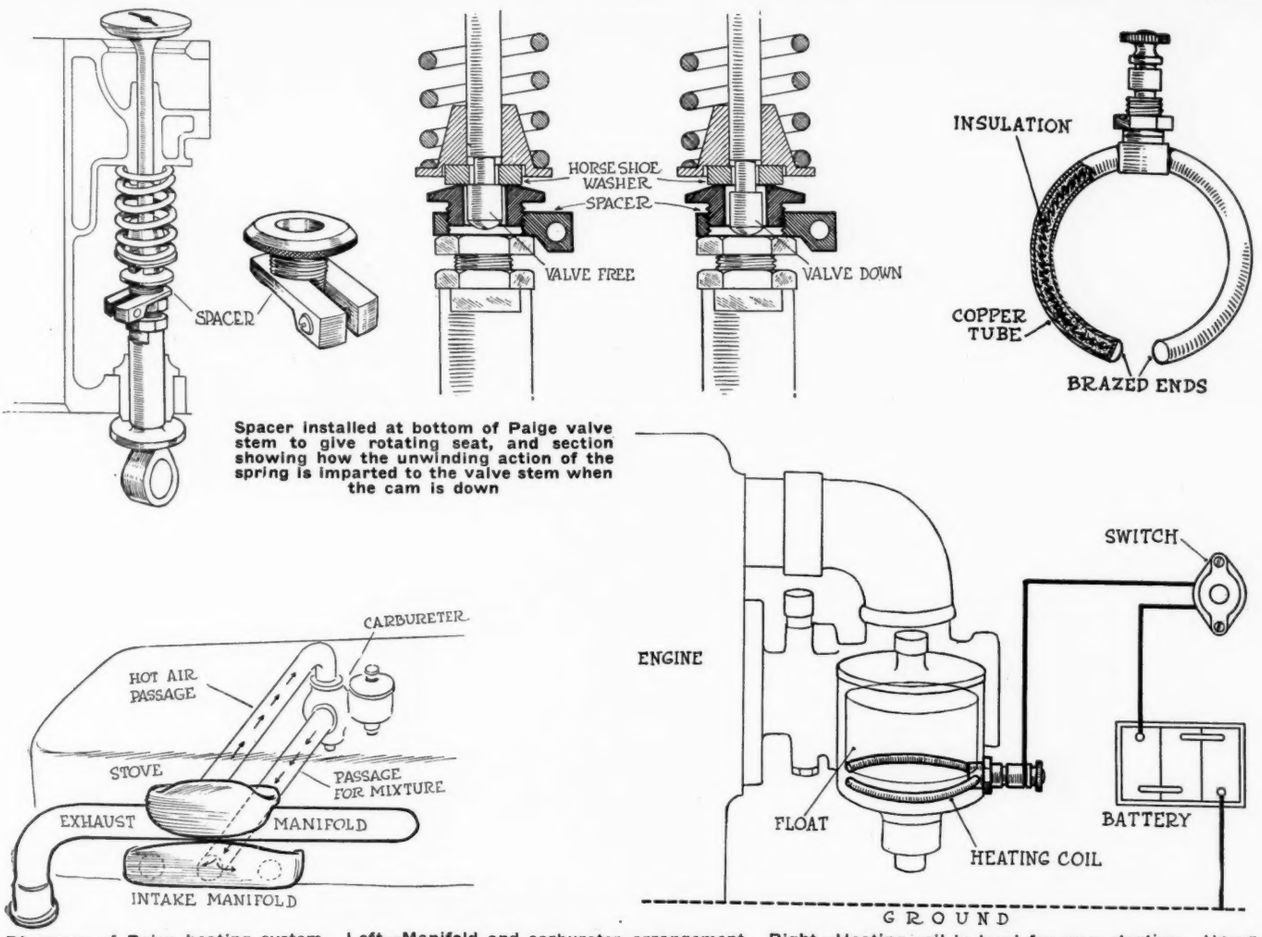
As shown by the accompanying illustration, the coil lies in the bottom of the float chamber, and the terminal projects through the float chamber wall as illustrated. The switch can be mounted at any desired point, preferably on the dash.

The manifold feature which is incorporated in the 10-D Continental engine, used in the Paige Model 55, can best be described by referring to the illustration herewith. As will be noted, the air supply passes transversely across the engine, the carbureter being on the opposite side of the cylinder block from the manifolds, where the hot-air stove is located. The air enters through the stove surrounding the exhaust pipe, passing through the cylinder block to the carbureter. Here it is mixed with the fuel, and the mixture then passes back through the cylinder block again to the intake manifold, from which it is distributed to the intake valves. This gives a progressively heated mixture, with the air being moderately warm before coming into contact with the fuel and the mixture then heated in increasing stages as it passes back in close proximity to the exhaust pipe. A





Continental engine on Paige car with new fuel heating system



Spacer installed at bottom of Paige valve stem to give rotating seat, and section showing how the unwinding action of the spring is imparted to the valve stem when the cam is down

Diagrams of Paige heating system. Left—Manifold and carbureter arrangement. Right—Heating coil in bowl for easy starting. Upper Right—Detail of gasoline heating coil

feature of the intake passages is the constant section which is maintained throughout the entire passage of the gas. This section remains as near circular as it is possible to keep it, thus presenting a minimum of wall area for any given volume of gas.

The third addition to the Paige engine is a spacer placed between the end of the valve stem and the tappet in such a way as to allow the valve to seat with a rotating motion. It is a well-known fact that a coil spring, when compressed, tends to rotate or wind about its axis. Due to the fact that the valve is held fast under frictional contact with its seat, this rotating motion is not imparted to the valve with the ordinary arrangement.

The spacer is so designed as to allow the valve to be free of the influence of the spring when it has reached its seat, so that the friction on the seat is reduced to such an extent that the rotary motion imparted by the spring can be transferred to the valve, thus giving a wiping action, freeing the valve of carbon and eliminating pitting. The construction is shown in the accompanying drawings. As will be seen, the valve stem floats free when the tappet is at the bottom of its stroke. This allows the unwinding motion of the spring to be imparted to the spring retainer, and in turn to the valve stem, giving it the slight rotating motion upon its seat. The valve adjustment is made by means of the screwed piece in the spacer.

The Lauraine, a New American Magneto

A NEW high-tension magneto, made in both four- and six-cylinder models, has just been placed on the market by the Menominee Electric Products, Inc., 50 Church Street, New York. It has a Siemens shuttle-wound armature and is of the true high-tension type, its design being based on the leading makes of ignition magnetos on the market to-day, no attempt having been made to incorporate any radical features.

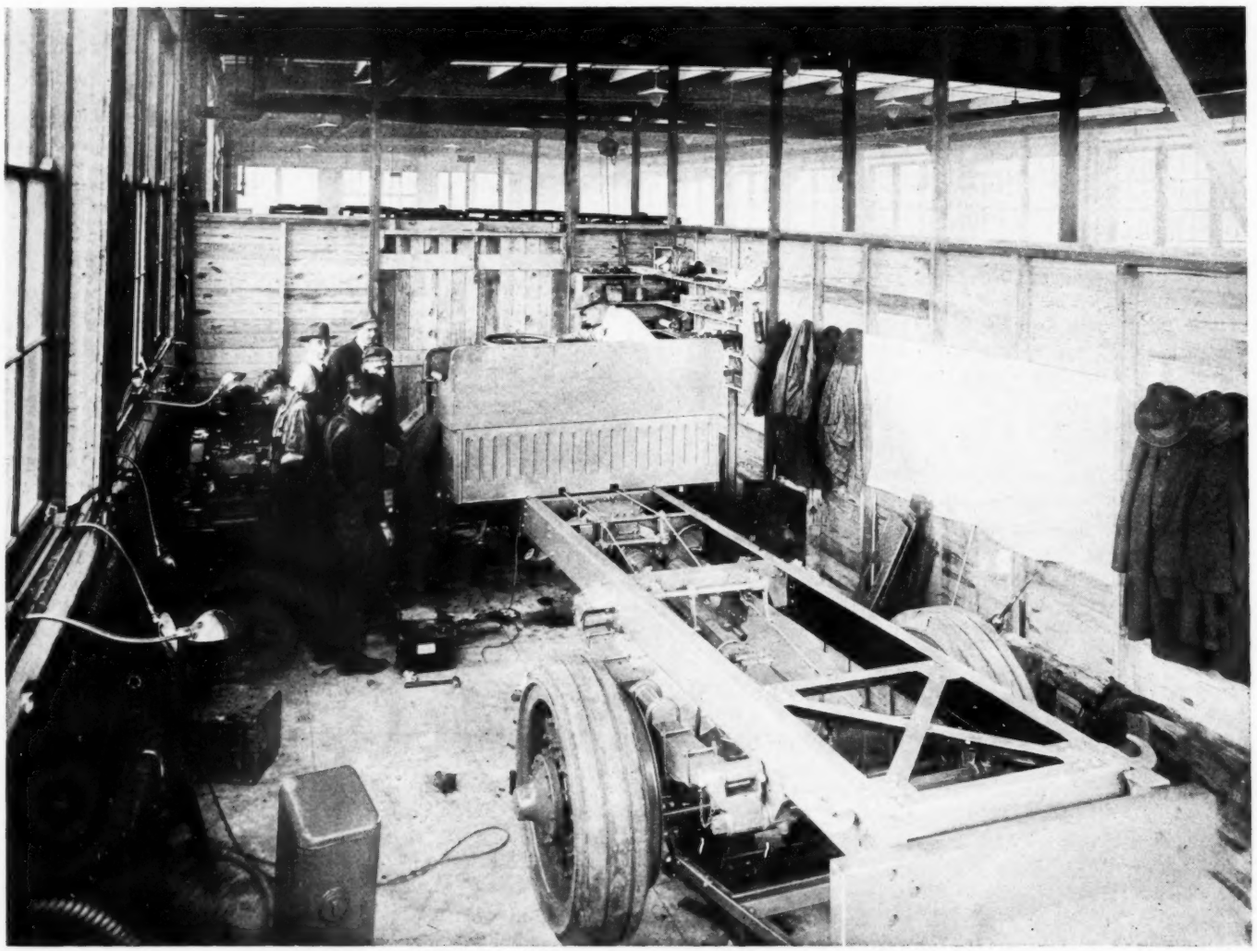
A waterproofing cover, which is said to be all the name implies, can be easily removed when it is desired to gain access to internal parts. Furthermore, either the magnets or the end plates can be removed without destroying the waterproofing effect.

The breaker housing is supplied with two arms, so that the magneto can be linked up from either side. The breaker arm bearing is built up of cross-section fiber, working on a pin which is integral with the main breaker block, thus preventing contraction and expansion due to temperature and atmospheric changes. All castings, including the bases and end plates, are made of bronze, to eliminate danger of warping and consequent disalignment. The cam is a section of steel tubing, which is shaped, hardened and ground to size. This mode of production is said to insure absolute synchronism under all conditions.

All insulating parts subject to high tension are made of hard rubber. A small window in the waterproofing cover permits of observing the spark at the safety gap. The distributor gear is adjustable for wear by means of an eccentric bushing, which is claimed to insure quiet operation for the life of the machine.

The Lauraine magneto is also made in aluminum for aircraft work, by which construction a saving of more than 4 lb. is effected.

Greatest Achievement of Industry Seen in War Truck



The room where the Rochester war truck was built. Putting finishing touches on the engine control

NOTHING that has ever been done by the truck industry of any nation compares with the achievement of America in producing the standard military truck. The importance of the work extends far outside the immediate advantages of furnishing the army with the proper machines. It is impossible to put a limit upon the effect which the creation of this truck cannot fail to exercise upon the country and even on the world. First of all, it has provided an ideal which was lacking before, and it has roused the parts makers to realization that they were making only a few articles good enough for military service. This will lead to a large supply of much better stock parts for trucks.

Second, it has shown the truck assemblers and the parts makers the wonders that can be worked by cooperation. It has brought together all sorts of business men as well as engineers, and has given them a common spirit, an *esprit de corps* which they never possessed before. Truck manufacturers have been much farther apart than the passenger-car men, and have helped each other less; there has been less universal effort for the good of the truck movement. The new spirit is bound to benefit the industry greatly.

Effect on Buyer

The effect of the military truck on the minds of commercial truck buyers has already begun to be noticeable. Probably the first indication of this is in the demand for lower gear ratios on low gear; and an even more direct indication is the fact that manufacturers of commercial vehicles are receiving demands for a truck for commercial purposes designed along the lines of the Government job. The manufacturers who have made the Class B engines state that they are already receiving demands from assemblers of trucks for an engine along these lines for commercial purposes.

The influence of the military truck upon commercial practice is a healthy one. It is in line with the demand for the maximum performance with a minimum upkeep cost. It also indicates that first cost is considered not alone, but in conjunction with the

cost of maintenance and the life of the truck. In other words, truck buyers are more prone than ever to count the first cost *along with the maintenance cost* on their trucks in securing the cost per mile for a unit of weight. The 3-ton military truck is really a 5-ton job. It is capable, in other words, of as much overload as the commercial truck receives even in the most abusive service. The fact that this is so is no doubt one of the great factors in making the commercial buyer desire a truck of military characteristics. This, of course, means that the engine must be capable of economically moving the load, and for this reason a maximum of flexibility giving efficient performance on varying loads, up to the maximum, is required.

Will Bring Four Speeds

One of the effects that this is going to have, in the opinion of a great many truck manufacturers, is an increase in the four-speed gearbox in trucks of a capacity of more than 2½ tons. For smaller sizes than this the four-speed gearbox does not seem to be a good commercial proposition; and in fact, the ratio of engine torque to required drawbar pull is so much larger in the smaller sizes that four speeds do not seem to be necessary from a standpoint of flexibility. The four-speed gearbox is a matter requiring education of the driver also. A passenger-car trained man generally does not handle this four-speed gearbox as well as he should, the tendency being, of course, to travel on the high gear at all times. When the four-speed gearbox is installed it ought to be used, and when employed properly the extra cost of installation soon comes back many times over into the coffers of the truck buyer. The case is paralleled exactly in the tractor, where a plowing-gear ratio is furnished, as well as a higher gear ratio for lighter drawbar requirements. When the drawbar requirements of the truck are high, due to load, heavy roads, or hilly country, the use of a gear ratio which is not so low that it requires too high an engine speed, or not so high that it overloads the engine, is something which is very desirable, and which is readily furnished by the four-speed gearbox. The fact that a four-speed gearbox is going to be installed in a truck gives the designing engineer so much flexibility in his engine design that he can produce a power plant much more suited to secure the best results to the truck user in capacities of 3 tons and over.

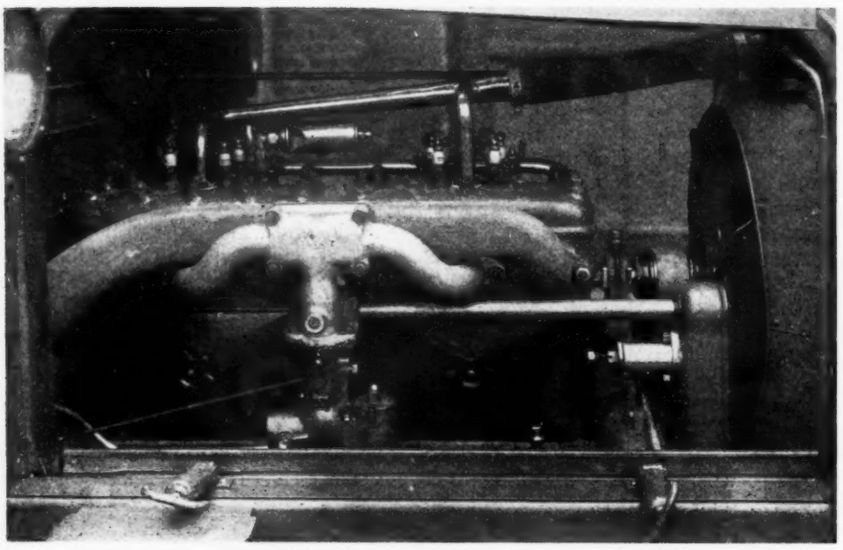
Every individual who worked on the war truck is a better engineer and a better man because of it. It has caused a big increase in estimation of one man for another, for the often extremely difficult progress of the work showed up much more unsuspected strength than weakness. This applies not only to the truck engineers, but to the military men who worked with equal vigor and enthusiasm, to the detailers, the tracers and even to the blueprint department.

Right — The gang that built the Rochester truck

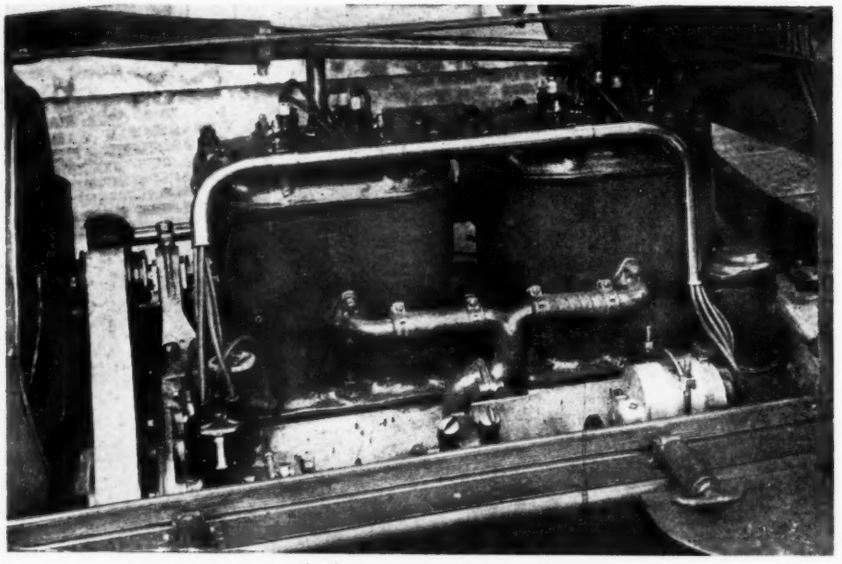
Below—The truck's first appearance on the road. Left to right—W. E. Dugan, factory superintendant; W. T. Norton, Jr., chief engineer, and Mr. McIntyre, experimental engineer, all of the Selden Motor Vehicle Co., and A. Ludlow Clayden, engineering editor Automotive Industries

It was not comfortable work. Equipment for drafting was poor, consultations were conducted amid constant interruptions. the engineers were without the files of data which they are accustomed to keep at their elbows.

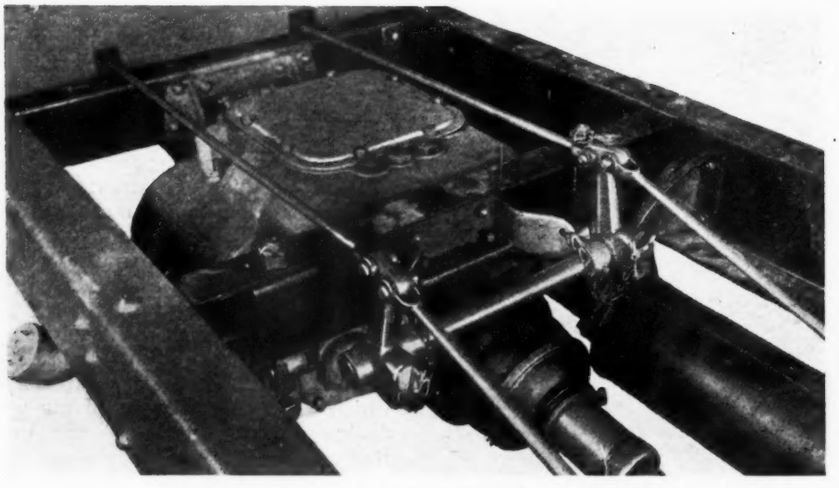
Outside of the drafting, a corresponding state of things existed in the factories. The production of the samples was attended with even greater difficulties than their design, especially because of the great distances which often lay between plants producing adjacent parts of one unit. Here again the pull-together spirit was wonderful.



Right side of war truck engine, showing hot spot manifold



The electrical side of the engine with all ignition fittings



Details of the transmission mounting, and first brake shaft

Prominent Details of War Truck

THE illustrations on these two pages show many of the features of the standard military truck which have been mentioned on previous occasions. The two views of the engine installed in the chassis give an excellent idea of its accessibility. On the right side conspicuous points are the high placing of the carbureter and the absence of anything to interfere with the removal of the valve covers. It is not necessary to do more than unhitch the throttle rod in order to adjust the tappets, and the job could be performed without even this. The governor adjustment, which, however, is to be sealed by the engine builder, and the spark plugs are also accessible from this side.

Good Grouping

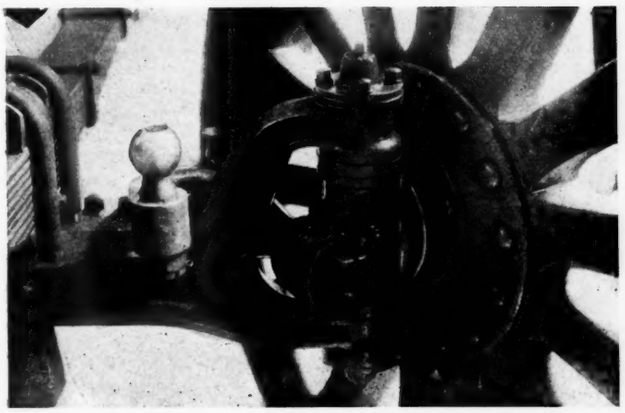
On the left side the spark plugs are as getatable as from the other side, and all the rest of the ignition. The magneto comes away complete after taking a bolt out of the coupling and disconnecting the advance rod, and the complete battery distributor can be taken off equally easily. The fan belt adjustment is accessible from either side. The two grease cups seen on the pump are the only two on the engine, and it is time saving to have them on the same side as the oil filler. The enormous fan and radiator cowl are well seen in these views.

The gearbox mounting is seen complete in the bottom picture, except for the two bolt hanger which encircles the front end of the case. Also the first brake shaft with its oil reservoir wick feed lubrication appears in the same view.

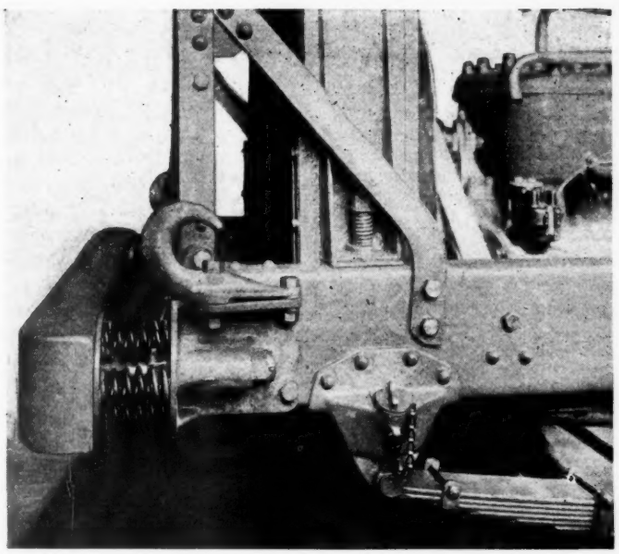
Spring Bumper

On page 767 perhaps the most interesting illustration is the one showing the spring radiator mounting and the front bumper, which is a solid piece of wood, the towing hook and radiator guard. Also the detail views of the spring hangers show that the oil reservoir system does not call for an exceedingly large bracket, in fact these hangers are neater in appearance than many of conventional type. The heavy clip blocks on both front and rear springs should be noticed; also the long nuts on the clips.

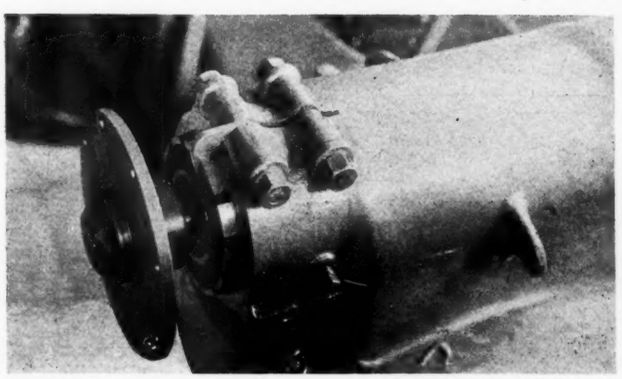
Various Details of War Truck



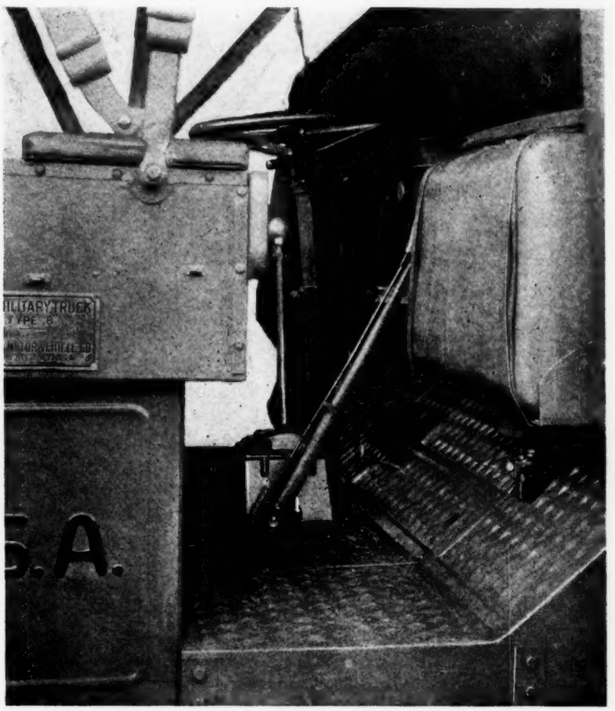
The front axle swivel has oil lubrication



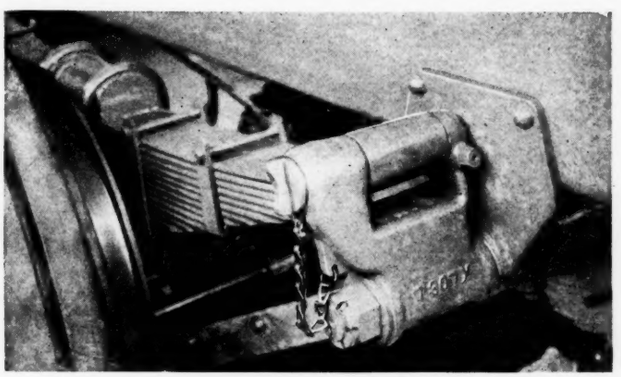
Radiator guard and spring bumper amply protect the front of the truck

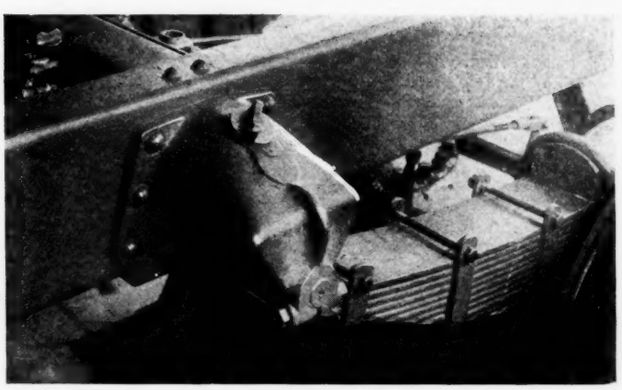


Method of locking worm bearing adjustment. Note hooks on case for lifting worm assembly out of axle

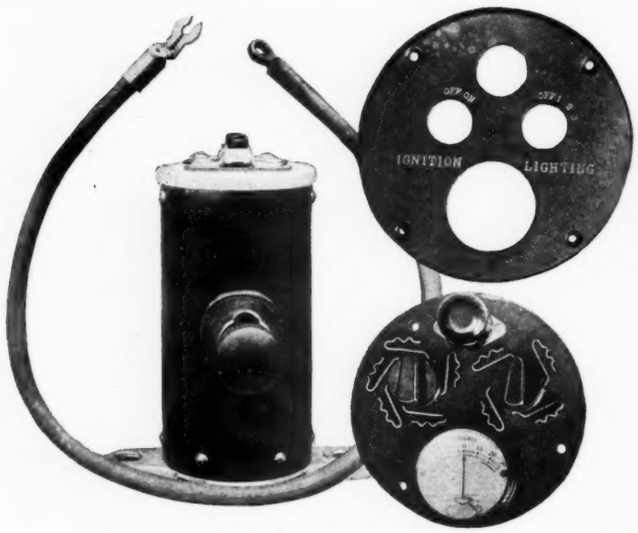


All the driving control is well located, accessible without reaching. Seat and floor boards are all light sheet steel welded together. There is more foot room than this photograph suggests owing to the height of the seat

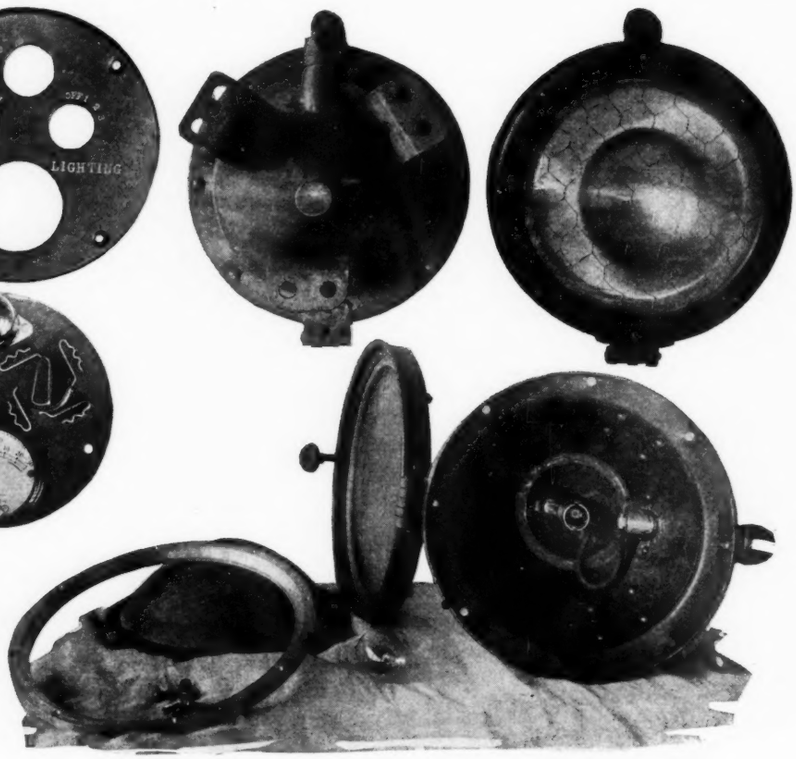




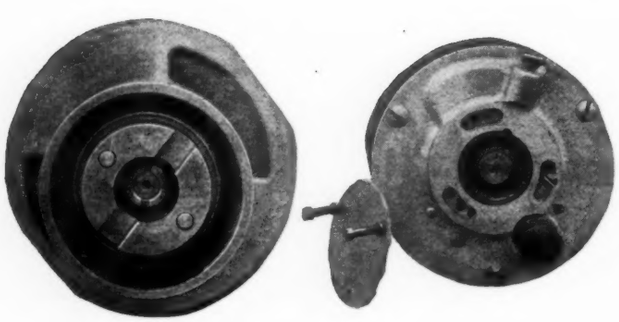
The oil containing, wick feed spring brackets are neat in appearance and give promise of being very successful.. The filler caps are securely attached by heavy brass chain



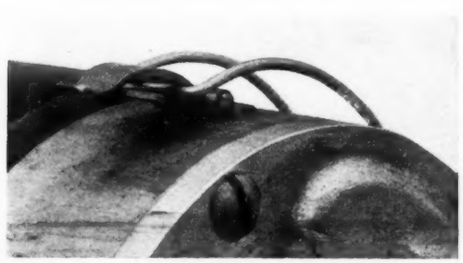
Coil and switch for army truck. The coil is mounted beside the distributor on the crankcase. The switch combines cowl light, ignition and lamp control and ammeter, and the cover incloses it water proof



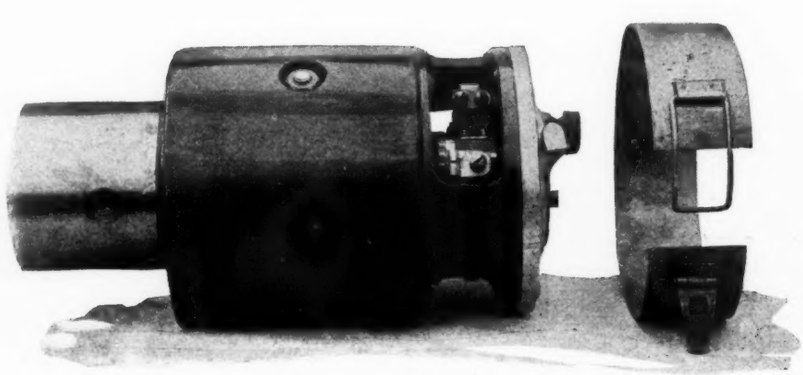
All parts of the special headlamp. The reflector is glass with a silvered back, protected by a 1/32-in. coating of electro copper; it cannot tarnish. Focusing is performed by the knurled screw at the back of the lamp case. The front door clamps shut and is hinged, the reflector being secured by a ring with 8 screws and a soft gasket



Above, left—The pilot end of the generator, showing the Oldham coupling. Right, the opposite end of the generator with cover removed and third brush adjustment exposed



Details of the spring snap catch for securing the band covering the brushes

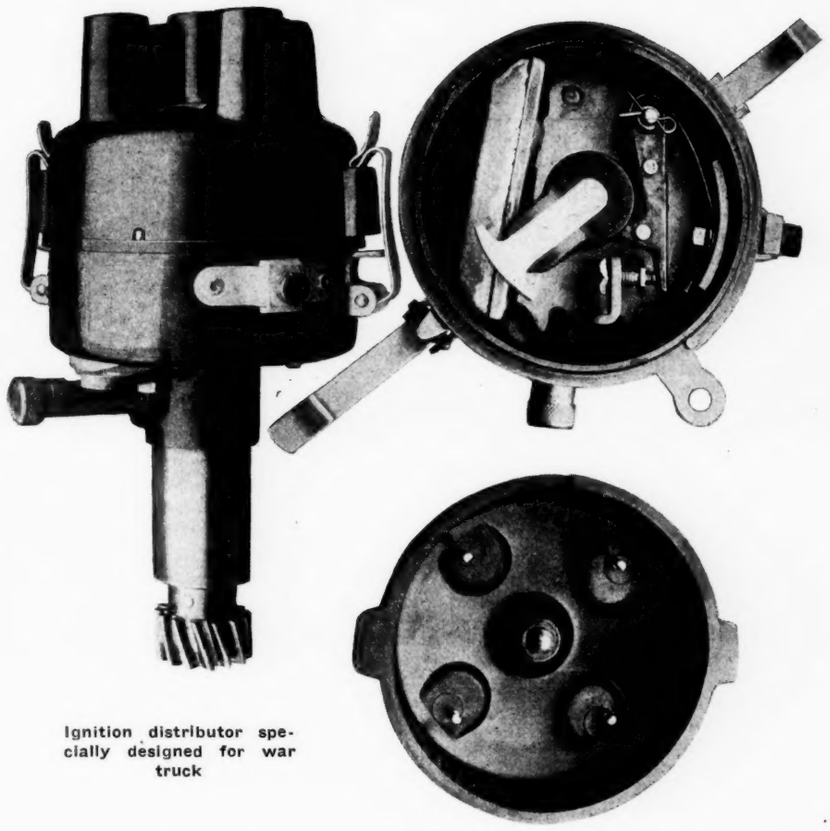


Right—Complete generator, showing pilot and brushes. The clamp bolt for pilot fits in the countersink

Electrical Units on War Truck

STRENGTH and simplicity are the outstanding features of the electrical equipment of the standard military truck, as can be imagined from the illustrations herewith. The magneto is not special, and several makes may be used, but the whole of the rest of the equipment is new.

The generator is made so as to be specially easy to attach and detach. It pilots into a deep recess in the crankcase, where it is held by a clamp screw, and the gear which drives it is a separate assembly. Back of the gear is an Oldham coupling, so that the generator can be removed and replaced without interfering with the drive. The clamp bolt cannot be tightened until the generator pilot is right home —that is, until the coupling is fully engaged.



Ignition distributor specially designed for war truck

Third Brush Regulation

Regulation is performed on the third brush principle, and the adjustment for setting the charging rate is disclosed by taking off a small plate on the outer end. This uncovers three screws, and to adjust the brush these are loosened and the brush carrier rotated.

Access to the brushes is given by a spring band with a quick-acting snap catch, and the brush holders lift up readily for the insertion of new carbons. There are no attachments to the generator except the wires, so that the whole unit can be removed easily in less than five minutes.

The distributor comes away with equal ease, but the adjustment of the breaker can best be made by taking off the cover only. As can be seen, the switch parts are unusually robust and the cowl light is combined with the switch. This has a rotatable cover that can be used to darken the lamp, if required.

Glass Reflectors

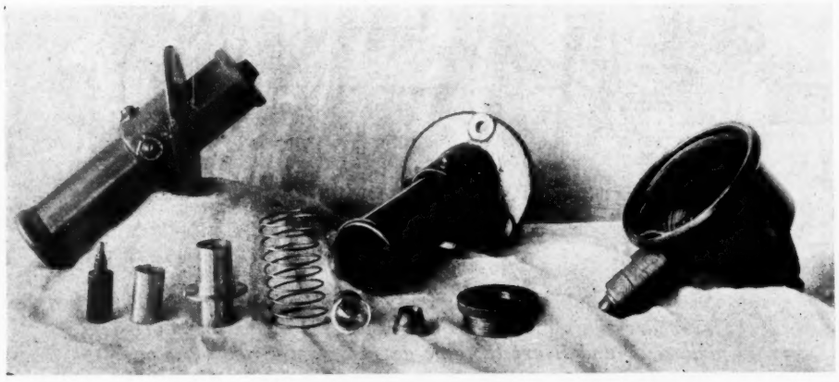
The headlamps have silvered glass reflectors which are untarnishable, and a facile outside focusing arrangement. Though small, they are massively built and very powerful. The danger-zone lamps, founded on an article of W. F. Bradley's, set in the dash at 30 deg. to the horizontal, and are so heavy that they could not suffer accidental injury.

The tail lamp gives a red light only and has no white glass, since there is no need for the illumination of a license tag and it is desired to keep the real light to a minimum. All the wiring will be inclosed in extra heavy conduit.

It may be noticed that there are no fuses. Instead there is a coil which heats up and prevents the passage of a dangerous current should a short occur. This is contained within the coil assembly.

There is likewise no cut-out, but the generator coupling drives through a ratchet clutch which enables the armature to overrun the driving gear. If the ignition switch is left in the "on" position when the engine is stalled the battery current drives the generator slowly as a motor, and this causes a clicking sound calling the attention of the driver to what he has done. This is a device which has been used extensively by a well-known European manufacturer of generators, and works well. Of course, the elimination of fuses and of the cut-out is for the purpose of avoiding delicate parts which might get out of order.

For maintenance it is the understanding that the system employed in case of any electrical trouble will be to change the unit for a duplicate complete part. Probably replacing the generator brushes or renewing the breaker contacts would be about the extent of detail work that might be done on the road.



Danger zone, minimum light dash lamp and tail light

Double Reduction Rear Axles

Historical Notes—Proper Place for the Differential—Advantages of Double Reduction Axle—Some Modern Types —An Axle Well Adapted to Specialized Manufacture

By P. M. Heldt

THE so-called double reduction rear axle for motor trucks has found its widest application in England. Though it has been very successfully used in this country by one concern for a good many years, it has never met with much favor among truck manufacturers here. In addition to the manufacturer referred to, who has used it exclusively, another prominent truck maker producing a complete line had adopted it for his 1½-ton model.

"Double reduction axle" is not a very happy term, as it describes also the so-called internal gear drive axle, although it is applied only to the axle in which the drive is accomplished by one set of bevel gears and one set or two sets of spur gears. The writer prefers the term bevel-spur drive axle as being more specific, but realizes the difficulty of changing established terminology, however defective it may be.

The earlier motor trucks mostly had side-chain drive. It was the difficulty of protecting the chains from mud and grit and keeping them lubricated that led to the development of the live axle, one type of which was the double reduction drive axle. Just what concern was first to bring out a design of double reduction truck axle is hard to tell, but the Renault firm of France was early in the field. In the 1911 French military truck trials Renault entered a number of cars with a special drive. Up to this time chain drive had been practically universal on French trucks, and it was fit that the Renaults, who were first to introduce the chainless drive in France for passenger cars, should also be first to break away from the practice of chain driving for heavy vehicles.

Renault Has Unique System

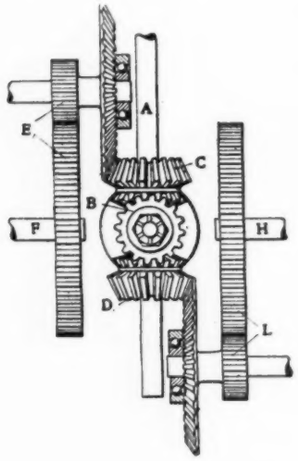
In the Renault drive an extension of the propeller shaft carries a bevel pinion differential. The side gears of this differential are double faced, the outwardly facing gears meshing with large bevel gears on transverse shafts, one in front and one behind the rear axle. These transverse shafts also carry spur pinions by which the power is transmitted to spur gears on the axle shafts. An advantage of this construction is that, as the differential turns at engine speed, it can be made quite small. On the other hand, the driving gear housing becomes quite bulky, as it has to extend both forward and to the rear of the axle a considerable distance.

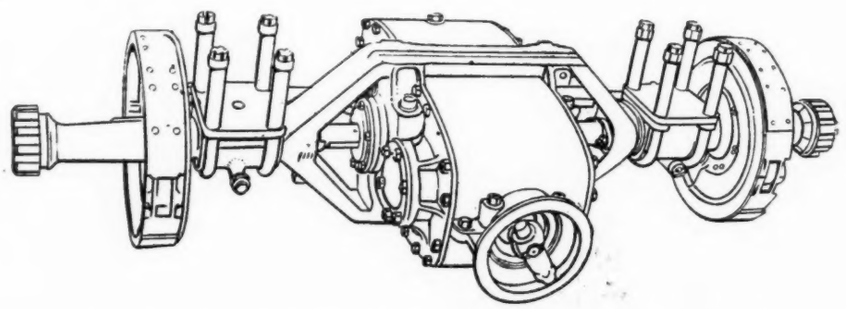
In this country the double reduction rear axle for trucks was introduced by the Autocar Co. which to-day remains the foremost champion of this drive. In England at least half a dozen different concerns have built trucks with double reduction drive axles. It is believed that in England the development of this type of truck was promoted by the ban on worm drive for military subsidy trucks by the British War Department previous to the war.

Have Spur After Bevel

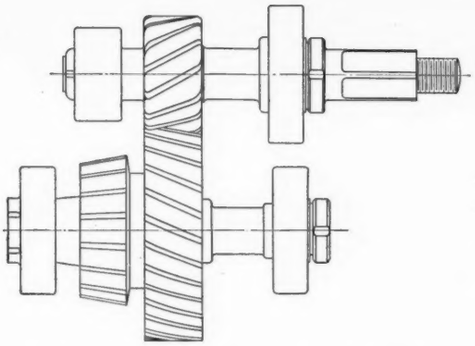
In a double reduction drive, which comprises one reduction by bevel gears and another by spur gears, the first reduction is usually by bevel gears. The reason for this is that the bevel gear side thrust is then much smaller, and as it is always something of a problem to take care of the side thrust, the smaller it can be made the better. An exception to the general rule is found in the White 1½-ton truck in which the spur gear set is placed ahead of the bevel gear set. This drive seems to have been developed from the drive of the White steamer, in which there was a two-speed gear combined with the rear axle. One object of the designer seems to have been to eliminate end thrust on the bevel pinion shaft, for instead of using a straight spur gear he uses a helical gear. This, of course, also tends to quiet running, but inasmuch as truck engines always run at moderate speed a straight spur gear would hardly be objectionable on the score of noise. The end thrust due to the helical teeth is opposite in direction to that due to the bevel teeth—for forward motion—and presumably equal to it, as this result could be easily achieved by giving the teeth of the helical gear a suitable angle. For the reverse drive, however, the two end thrusts combine, as the end thrust due to the bevel teeth does not change direction with a change in direction of the gear wheels. The amount of backward running is negligible, however, as compared with the amount of forward running, hence the amount of wear caused by the heavy thrust load on reverse will not be great.

The design of a double reduction gear housing is not a simple matter by any means. Even the ordinary passenger car rear axle drive is a pretty complicated mechanism and when either one or two pairs of gears with their accompany-

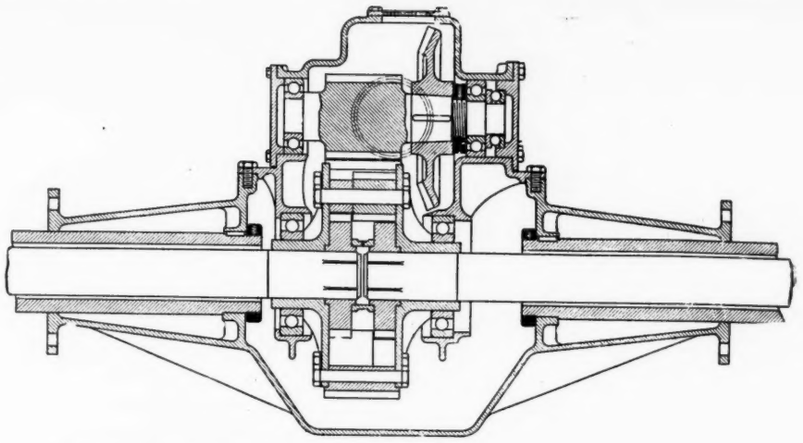




Renault system of double-reduction and a complete Renault axle. A is the propeller shaft and B the differential, C and D both being driving pinions; F and H are the axle gears driven through the spur pinions E and L



System used on 1½-ton White truck. Here the spur reduction is ahead of the bevel drive



Axle on the Scout truck, which has a spur differential on the axle shaft

ing shafts and bearings are added, the problem becomes only so much more involved. There are both radial and thrust loads on each of the three or four shafts and the bearings supporting each shaft must be arranged accordingly. If a type of bearing is used which takes both radial and thrust loads some of the difficulties are greatly reduced.

One of the first problems that come up in the design of a double reduction drive axle is the construction of the axle housing. Owing to the extra set of gears the central part of the housing is much bulkier and less regular in outline than the corresponding part of single reduction axle. The built up type of axle, with a central cast housing having drawn axle tubes inserted in it, lends itself to this type of axle, but built up axles designed on these lines are not popular for truck work. For heavy loads, if there is to be used a central cast housing, it is usually provided with long hubs with a flange at the end of each, to which are bolted cast tubular parts on which the wheel bearings are mounted. In England forged axle housings of the so-called banjo type are very popular, for truck work.

Where a train of gears is used, as in this case, it is desirable that the whole train be so mounted that it can be assembled and tested before it is put into the axle. This makes it much more convenient to adjust the gears and permits a more accurate test of the adjustment. This leads to what is known as the gear carrier type of axle. Ordinarily the axle housing is of double banjo form and the gear carrier forms a cover plate for one of the large openings in the housing through which the gears are inserted. The objection to this is that the gear housing of the axle and consequently the propeller shaft are rather high. This necessitates a high chassis frame which is rather contrary to present tendencies. The height of the propeller shaft is determined by the fact that the intermediate shaft is located directly above the rear axle, so the rear end of the propeller shaft will be higher than the rear axle center by an amount equal to the center distance of the spur gear set.

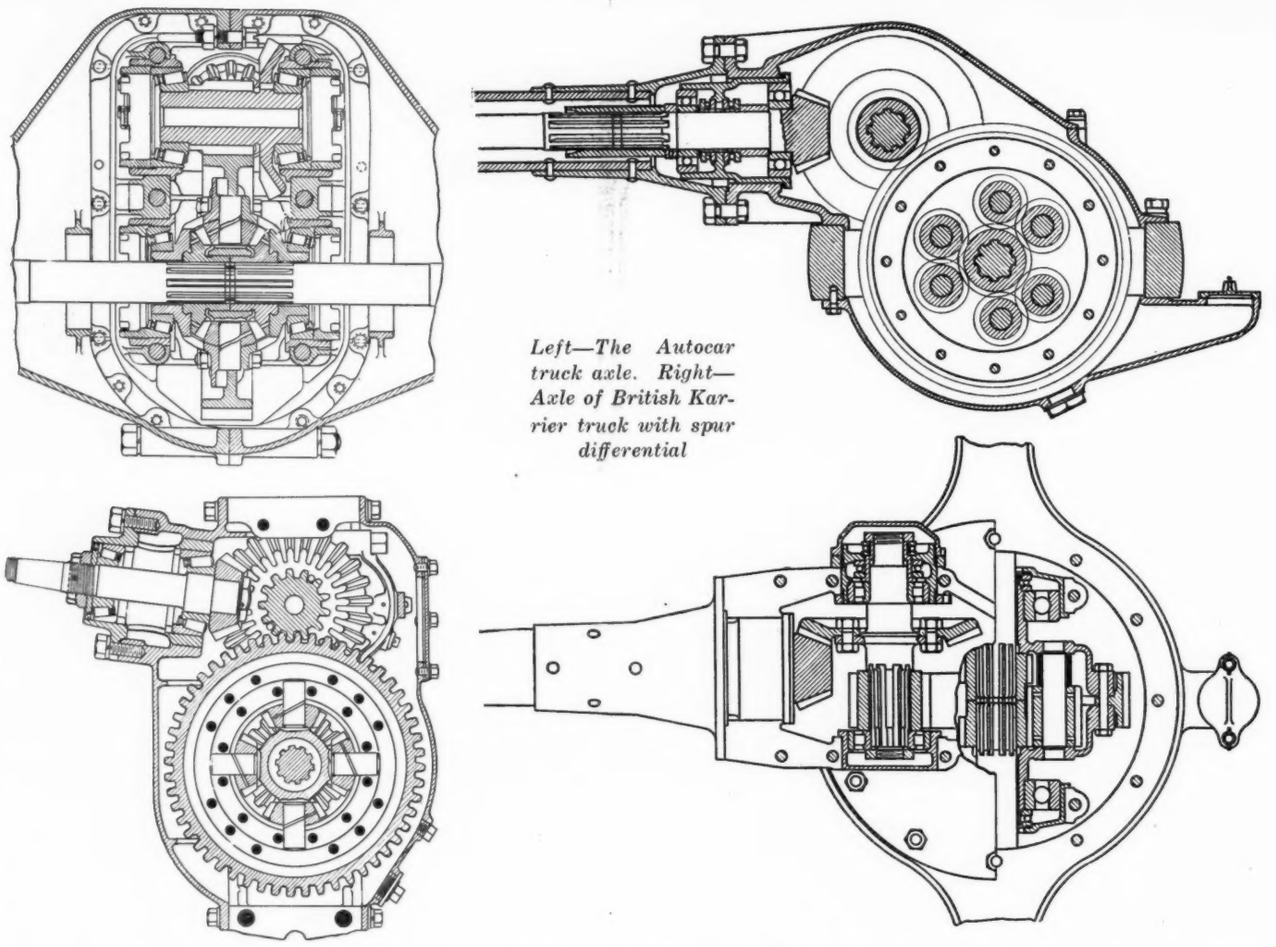
To Cut Axle Height

To reduce the height of the propeller shaft the spur pinion shaft may be placed forward or back of the axle. It can be placed directly in front of the axle, but the more usual plan is to place it so that the plane through the spur pinion shaft and axle makes an angle of 30 or 45 deg. with the horizontal. This raises the rear end of the propeller shaft somewhat and tends toward a straight line drive.

Of the type in which the spur pinion or intermediate shaft is on a level with the axle shaft, the Wrigley, made by a British parts manufacturer, is an example. This axle has a housing of the banjo type with a gear carrier secured to the front of the banjo. The gear carrier is split vertically through the axis of the spur pinion. A combination of ball and roller bearings is used on the short shaft, being disposed in such a manner that all the heavy loads come on roller bearings, while the differential is carried in floating bushings and has plain thrust washers on both sides of it. The gear carrier in this axle is a rather expensive part, as not only has it a vertical joint through the spur pinion axis, but the bevel pinion shaft is mounted in a separate hub which spigots into a hub on the main casting and is flange-bolted to it. The complete driving gear and differential can be removed from the axle as a unit. The rear cover of this axle is a dome-shaped casting and carries the oil filler which is cast integral with it and provided with a hinged cover. Oil has to be used as lubricant on account of the floating bushings on the differential. While in most bevel-spur drives the spur pinion is forged integral with its shaft, in this case it is fitted to a fluted portion of the shaft. The thrust on the cross shaft due to the bevel gear is taken on a ball thrust bearing and any reverse thrust is taken up on the rounded point of a set screw extending through a cap bolted over the housing at one end of the cross shaft. This particular axle is perhaps as nearly symmetrical as any axle of this type.

Of the type of axle in which the spur pinion shaft is located directly above the rear axle there are several examples, including the Autocar and the British Scout and Maudslay. The first named has a rear axle of double banjo type made up of two steel castings bolted together in the middle. The gear carrier serves as front plate and there is a cast rear plate of the same outline as the front plate. In this rear plate there are an oil drain plug, an oil level plug and an inspection hand hole closed by a plate. All bearings of this drive are of the conical roller type which take care of both radial and thrust loads. Both the spur pinion and bevel gear are integral with the shaft, a feature that considerably reduces the machine work required. In order to reduce the work of the universal joints the bevel pinion shaft is set at a slight angle with the horizontal, so as to produce a straight line drive when the truck is loaded.

The Scout axle is of the built-up type with a central cast housing into which the gear carrier is set from the top, the



Left—The Autocar truck axle. Right—Axle of British Karrier truck with spur differential

same as in the Pierce-Arrow worm-driven axle. Ball bearings are used thoughout in this axle and even in the universal joints. The fact that no thrust bearing is provided to take up reverse thrust on the pinion (or to prevent the pinion being forced into the bevel gear) may seem a defect to some engineers, but the bevel pinion has quite a large pitch angle, so there is considerable thrust forward under normal conditions, which must be overcome before there can be any reverse thrust. The gear carrier is made in two parts, with a horizontal dividing plane through the axis of the intermediate shaft. There is an inspection hole with cover plate directly over the bevel gear and there are also cover plates at both ends of the intermediate shaft.

Strength of Casing

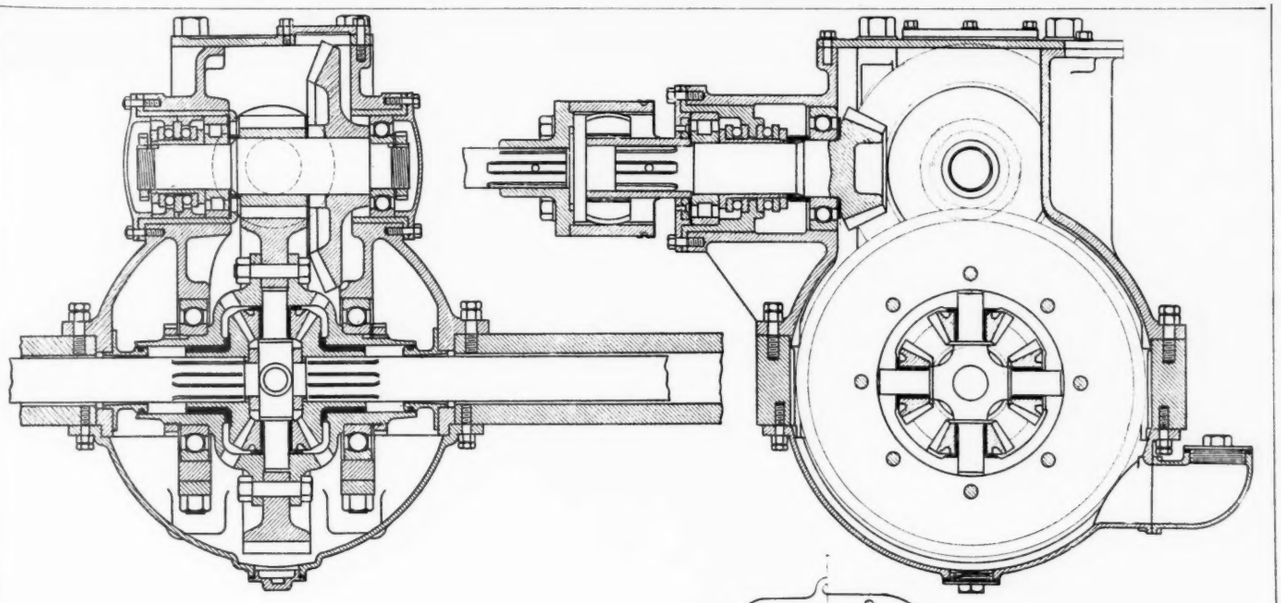
Another axle having the intermediate shaft directly above the rear axle is the Maudslay. This axle is of the banjo type, the banjo being placed horizontally. Ordinarily it is considered that it is advantageous to have the banjo in a vertical position, because the heaviest strains on the axle housing are those due to the weight on it, which act in a vertical direction. It has been argued that there are also heavy horizontal strains on the housing due to the propelling thrust in starting and due to braking. These may closely approach the weight on the axle in value. But the dead load is not the maximum vertical force acting on the axle housing, as the strains are considerably increased when a wheel drops into a hole, for instance. In normal use the maximum vertical load on the housing always exceeds the maximum horizontal load. Of course, if the rear wheel hub should foul a building wall or other rigid obstruction while going at some speed it would be a different matter. This contention is, moreover, borne out by the fact that when the banjo is placed horizontally there is always much more metal in its walls than when it is vertical. The Maudslay axle is fitted with ball bearings in all the most important places, but roller bearings are used on the bevel pinion shaft and the intermediate shaft where the loads are smallest. Double thrust bearings are fitted on both the bevel pinion and the intermediate shaft. The gear construction is also carried out on the gear carrier principle, but the carrier is not split through the axis of the intermediate shaft bearings, this shaft evidently being assembled with its gears and bearings while in the carrier. There is a large opening on top through which the bevel wheel can be inserted. The cast lower half of the gear case is fitted with an oil filler.

Somewhat related to the Maudslay design is the Karrier, in that it also employs a horizontally disposed banjo. But in this case the plane through the axle and intermediate shaft, instead of being vertical, is inclined forwardly at an angle of 45 deg. whereby the height of the propeller shaft is somewhat reduced. The gear carrier is split through the axis of the intermediate shaft. As in other designs described, ball bearings are fitted on the intermediate shaft for the radial loads, in addition to which there are two ball thrust bearings. There are also double thrust bearings on the bevel pinion shaft.

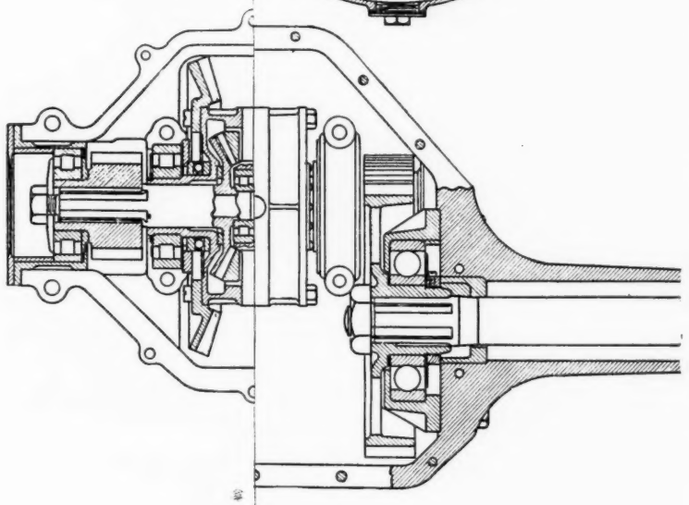
All of the British axles so far described are of the full floating type, permitting of withdrawing the axle shafts from the axle while the truck is resting on its wheels. This feature, of course, is necessary in order to make the gear carrier of any value, as the axle shafts must be withdrawn from the differential before the gear carrier can be lifted out of the axle. In the case of the Karrier axle, the differential can be removed either from the top or the bottom. These points in design have been somewhat influenced by the British subsidy regulations which require that it shall not be necessary to jack-up or remove the road wheels in order to remove the differential and driving gear from the axle.

In most of the double reduction axles the differential gear is located on the rear axle and the drive to it is through one pair of bevel gears and one pair of spur gears. This makes

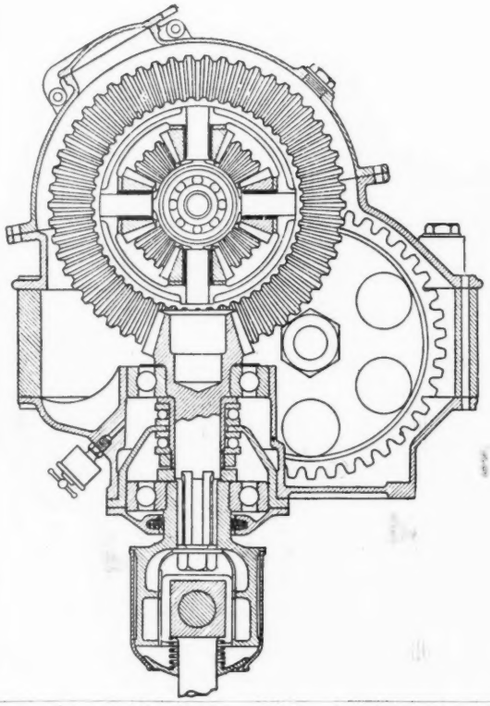
(*Continued on page* 812)

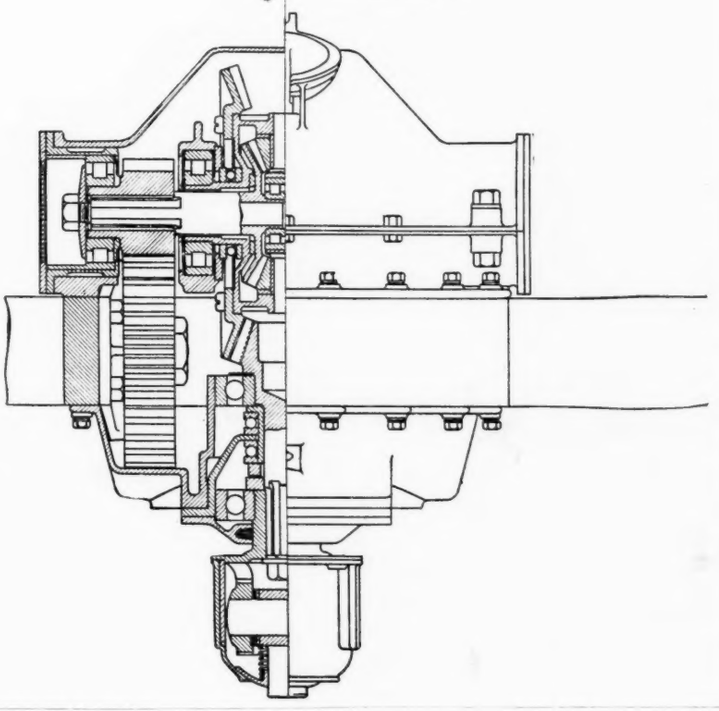


Above—The British Maudslay truck axle with four-pinion bevel gear differential



Below—Axle of the British subsidy model built by the Pagefield Co. This is a recent design, and it will be noticed that it embodies the high-speed differential





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The AUTOMOBILE

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War Truck Economics

ENGINEERS as well as manufacturers, and manufacturers as well as nations, must tune themselves to the trends of the times. These are co-operative days rather than individualistic days. The war has impressed on us the fact that two nations cannot go to war without influencing many other nations. The day of the individualistic engineer is practically past. Developing a motor truck from radiator to rear bumper is too great a problem for any one engineer. The same applies to an automobile, to a farm tractor, and to a motorcycle. The most valuable lesson in connection with the standardized heavy-duty war truck has come from those engineering conferences participated in by the different engineers working on the respective units, such as engine, transmission, axles, and chassis. These conferences were really specialized and co-ordinated engineering thought.

Such conferences tend to place the individual below or secondary to the engineering problem. They make it impossible for the individual to inject whims or hobbies. Engineering conferences of this nature have always been beneficial and several of our strongest automobile concerns can point to such engineering co-operation or co-operative consultation. Many of the largest European automobile makers followed this co-operative consulting method. The individual engineer who attempted to solve every problem from radiator to axle and to design all parts entering into the vehicle has cost America millions and has wrecked many concerns.

The safest factor in connection with the present heavy-duty war truck is that it represents the consensus of engineering mind of many individuals. As such it must be a fairly well-balanced whole and must consist of the many bests in engineering. It must not be expected that it is perfection in its present form. It would be impossible to think of so many engineers getting together in this specialized and co-ordinated engineering effort that they would make a 100 per cent success of the first attempt. There will have to be some paring done on the truck, but in its present form it represents the best aggregate of engineering talent that could be obtained.

Civilians at Washington

CIVILIANS called to Washington to aid our government will work at their best and will do what the government really desires if they bring with them their usual industrial manners and methods, and do not entangle themselves in needless red tape.

Entering the war 3 years later than the Allies and profiting by their many costly errors, the United States has arrived at methods of operation probably unparalleled in history. Its navy and war departments have called for the complete co-operation of the greatest administrative and technical intellects in the industrial world to instill business efficiency into the war, to make this combat a business-like one, to go about the business of defeating Germany in a commercially scientific manner.

And both the war and the navy departments, realizing the value of this co-operation, and grasping its ability to bring the war to a more speedy successful conclusion, have to a remarkable extent discarded the burdensome and mischievous red tape and military precedents of the past to better aid the civilian coworkers, with the result that wonderful work has been and is being accomplished; and the civilian worker who is earnest and sincere finds no difficulty in his path and only a smoothly running co-operative system on the military and naval side.

But the civilian workers in some instances are inclined to make an error—one that is natural enough but likely to work considerable damage and undo much of the good that has been accomplished. They are entering upon their work in Washington unmindful that they have been called because they are civilians of high industrial ability who will inculcate business methods into the war and navy departments, and they turn from their civilian industrial training toward the military ceremonies and precedents, burying their excellent civilian and industrial qualities beneath a mass of the very practices Washington hopes to discard—the red tape and the precedents that in the past have hindered, hampered and destroyed efficiency in wartime.

The leading officers in Washington are broad-minded men. They are individuals who hope only

for the success of the United States. They are working solely with that object in view. They know civilians and civilian life. They do not seek or expect observance of army regulations from those civilians called to Washington. They will not suffer offended dignity if a civilian overlooks army precedents and regulations as he successfully creates additional means toward victory for our armies.

1918 Tractor Demonstrations

TRACTOR manufacturers are to be congratulated on deciding to hold real demonstrations next year in which an endurance test, belt work, engine power, fuel consumption and other factors will be considered. This is a step in the right direction and points to the now famous Winnipeg tractor trials of some years ago when tests of this nature were made. It was an unfortunate day for the tractor industry when the character of the Winnipeg trials was not as fully appreciated by many manufacturers as it should have been.

The suggestion of the tractor makers to hold the 1918 trials if possible in the manufacturing vicinity of Cleveland or Detroit is good, because these demonstrations are manufacturers' demonstrations. They have ceased to be demonstrations for farmers. As an industry the tractor makers require manufacturers' demonstrations, governed by rules that will show the relative merits of different designs and which will also show the adaptation of different types to the same work.

Next year's demonstrations will be more international in character than heretofore, due to important demonstrations scheduled to be held in England in August of 1918. It would be unfortunate if the English demonstrations should be held the same month as the American ones, and the committee in charge should take the question up with the British organization. As America becomes more and more an exporting nation her demonstrations of this nature should be timed to work in to the best advantage of other countries. There are now Canadian demonstrations, Scottish demonstrations, and next year there will be English demonstrations. An international program should be developed if possible.

Air Washers

EXAMINATION of the lungs of a coal miner after death shows that one of the reasons for a short average life is the remarkable accumulation of coal dust in these organs. A parallel examination into a number of defunct tractor engines shows that the short life of the tractor engine in certain parts of the country is due to the fact that the engine breathes in immense quantities of gritty dust. What applies to the breathing apparatus of the human being applies to the mechanical parallel as well.

The motor truck is a dust breather, and yet the question of fitting an air wash on the commercial car has hardly been considered. The vehicle used in inter-city traffic particularly should be considered in this respect. The dust-laden air is drawn into the cylinders at every intake stroke and it is only fair to assume that only a certain percentage of the gritty substances drawn in with it are expelled with the exhaust.

An interesting example of this difference in life due to the accumulation of the emery-bearing dusts in the interior of the engine can be seen by comparing the life of the marine gasoline engine and its counterpart in the truck. The marine engine operates mile after mile under full load with the throttle wide open all the time and the truck engine runs under a throttle load of from 20 to 30 per cent most of the time. Yet the life of the average motorboat engine is in excess of the truck engine. There is no doubt but what the dust inhaled in the truck engine has much to do with this.

Motorcycle Standards

A YEAR ago the idea of standards in the motorcycle trade was unheard of, unless one except the spark-plug thread. To-day there are standard controls, standard wheel details and sundry other standards which will help both makers and users. At the first meeting it seemed little could be done until discussion warmed up, but from that instant motorcycle standardization has progressed at a pace equal to that of any other division of the committee.

The motorcycle industry is not spectacular, but it is a very live entity indeed. Its representatives are to be congratulated upon the great progress they have made in standards, and there is no doubt that this will lead to co-operation in other lines for the benefit of all concerned.

Closed Cars

THAT there is an unsual demand for closed cars the present fall is an impression gained from practically every conversation with sales managers regarding conditions in the passenger car business. The conclusion to be drawn is that many more people expect to keep their cars in commission the coming winter than have done so in previous years. There has been a gradual growth in the winter use of passenger cars, owing to the reduction in price of cars suitable for winter driving and to the gradual transformation of the passenger type of vehicle from a pleasure car to an economic necessity. No doubt shortage of labor occasioned by the war has something to do with the decision of many people to drive a car this winter. When department stores and tradesmen urge their customers to carry home bundles and service in many lines of business is curtailed owing to lack of help, it is indeed a boon to own a car that can be taken out in any kind of weather. The very material reduction in train service on suburban lines is another factor that favors the automobile business. Even the ordinary open car affords a fair degree of comfort in cold weather if the top and side curtains are up, but for use in the dense traffic of large cities this does not give the driver sufficient freedom of view, and a glass inclosed superstructure is wanted.

Latest News of the

No Protests Allowed on Priority Order

Coal Must Be Had for War Work—Open-Top Freight Cars Badly Needed

WASHINGTON, Oct. 31—Protests from whatever source against the latest priority order restricting the use of open-top freight cars—and these protests are coming in by the hundreds from automobile manufacturers and others—will be of no avail. It was stated at the office of Judge Lovett that this order was decided upon after the most mature consideration and after conference with representatives of many of the executive department heads of the government. The order was vital, it was stated, if coal is to be moved. Without coal the industries necessary to the prosecution of Government work will have to stop; therefore the order will stand.

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No Passenger Car Shipments in Open-Top Freight Cars

NEW YORK, Oct. 29—Beginning with Nov. 1, passenger cars will not be allowed to be shipped in open top railroad cars such as coal cars and gondola cars. This order has been issued by R. S. Lovett, Priority Director of the War Industries Board, and has been made in order to increase the shipment of coal throughout the country as necessary. It was found, for example, that coal production has been restricted due to shortage of cars. One large automobile concern has been shipping 60 per cent of its automobiles in coal cars. Other coal cars have been used for shipment of road-building material, the State of Ohio alone having 6000 carloads of road building material per week. By these and other restrictions it is hoped to increase the coal supply. It is realized that it was due to a lack of coal that Italy has had to withdraw and suffer the heavy defeat she has experienced within the last week. Coal is so important that it must receive every attention.

The Government has also forbidden the use of open-top cars for the transportation of materials and supplies for the construction, maintenance or repair of public or private highways.

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Licenses for Life of Enemy Patents Will Be Issued

WASHINGTON, Oct. 30—The Federal Trade Commission has issued regulations under which articles patented in this country by enemy aliens may be manufactured by American producers and, while, under these regulations, licenses will be issued for the life of the patent instead of merely for the duration of the war, exclusive licenses will not be granted to individuals or individual firms. Patents of paramount value to American industries are affected by this order, approximately 20,000 being affected.

In order for licenses to be issued under

(*Continued on page* 788)

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Freight Tax Effective Nov. 1

NEW YORK, Oct. 30—Effective Nov. 1, 1917, corporations receiving payments for freight, express, telegraph and telephone messages and other services, are required to collect taxes from the parties making the payments and make monthly returns to the Government. For instance, freight will be taxed 3 per cent, if it is within the United States and is taken by rail, water or mechanical motor power in competition with carriers by rail or water. One cent for each 20 cents or fraction thereof on express charges on goods within the United States will be charged. Telegraph and telephone messages, costing 15 cents or more and originating within he United States, are taxed 5 cents each.

Ford Loses to Dodge Brothers

Must Distribute $30,000,000 Profits Instead of Putting Money Into Furnaces

DETROIT, Nov. 1—*Special Telegram*—John F. and Horace E. Dodge have won their suit against the Ford Motor Co., which is required to distribute at least half its 1915 profits or about $30,000,000 instead of putting this money into the blast furnaces which Henry Ford proposed to build on the River Rouge. The Ford company will appeal the case.

In deciding in favor of Dodge Brothers Circuit Judge George S. Hosmer held that a corporation may not hold its profits without distribution against the protest of stockholders. The division of the profits is to be arranged by the parties concerned, and if no agreement can be reached, the courts will decide.

Judge Hosmer has held that the blast furnaces are not necessary to the Ford business and must not be built by the

(*Continued on page* 781)

Business Conditions Quiet

Important Readjustments Occurring—Freight Situation Bad—Material Situation Fair

DETROIT, Oct. 27—Business has been quiet for the past week, though in many instances the manufacturers report that it is as good as can be expected at this time of the year. These manufacturers are the large producers, and the ones that have been enjoying a consistently larger demand during the past year.

Many important readjustments have taken place in the industry recently. The Harroun Motor Corp. has received $650,000 in cash, and plans to reach a production of twenty-five cars per day within a month's time. In Cleveland, the Abbott Corp., and the Hal Motor Car Co. are planning a merger; the Monroe Motor Co., Pontiac, Mich., is moving its sales offices to Indianapolis; the Ross Motor Co., Detroit, has appointed a permanent receiver; Booth has resigned from the Scripps-Booth Co., and it is known that General Motors has taken it over; the Security Trust Co., Detroit, is taking an inventory of the Detroiter Motor Car Co., and running on moderate production, and Marion-Handly, or the Mutual Motors has closed for a period for the same purpose.

The freight situation has continued bad, and driveaways have offered little outlet because of the weather. The result is that cars have piled up more or less at the various factories. The lake routes are at present offering a partial outlet to the East.

One result of the war that is becoming evident is the attempt of the factories to materially better their dealers from a sales and service standpoint. They are realizing that increased sales resistance must be met with better salesmanship. Nearly all of the factories are holding dealer schools, service schools, conventions and conferences with just this end in view. They are attempting to make their present dealers better dealers.

In other instances, manufacturers are increasing the territory of their already successful dealers, and letting those dealers apply their methods to the entire territory. Unsuccessful dealers are being eliminated, and the successful ones becoming more powerful.

At present the material situation in the larger factories is not bad in most instances. Factories having large purchasing power and ready money are securing most of the attention of the material sources. The smaller manufacturer, with little resources and little demand is

(*Continued on page* 785)

Automotive Industries

Should Soldier Be Sold on Time?

Proposed Moratorium Might Result in Trouble for Dealer

NEW YORK, Nov. 1—Should a man who is likely to enter military service, voluntarily or by selection, be listed as a prospect by an automobile dealer?

Some of the dealers along Broadway are asking themselves this question in view of the moratorium bill that was passed by the House Oct. 4 and that will be considered when the Senate convenes in December. The spirit of this bill is that a soldier cannot be prosecuted at law until his return from the war, which would tend to prevent dealers suing on unpaid time payments. Of course, the average man would not take advantage of such a bill by buying a car when he knew he might have to go to war, but at least one factory has notified its dealer of the possibilities.

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Changes Asked on War Motorcycles

CHICAGO, Oct. 30—At a meeting of representatives of several motorcycle manufacturers held here to-day, T. J. Sullivan was appointed a committee of one and was instructed to write to the Quartermaster's Corps, Department of Transportation, requesting that in future specifications for the purchase of motorcycles, hand brakes, speedometers, and auxiliary oil lamps be omitted and that odometers be specified instead of speedometers. It is believed that in this way the Government can save a considerable amount and that the manufacturers will be relieved of an unnecessary tax on material and labor. The hand brake is not required, and its elimination would facilitate the removal of the wheel.

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Lovett Chairman of War Industries Board

WASHINGTON, Oct. 27—Judge Robert S. Lovett, of the priority board, who has succeeded temporarily to the chairmanship of the War Industries Board, following the resignation of Frank A. Scott, of Cleveland, on account of ill health, is expected to be named permanently to that position by the President.

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Coal Supply for Steel Makers of Munitions Assured

WASHINGTON, Oct. 31—Representatives of the largest steel companies in the United States, all of them actively engaged in the manufacture of munitions of war, at a meeting here with representatives of the Fuel Administration were assured that their requirements of fuel such as coal gas and by-product coking coal will be met by the government.

The representatives of the steel concerns promised that they would send weekly reports as to their fuel needs and of their shipments under contract.

Automobile Factories Asked to Plan For Munition Manufacture
See Page 745

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General Motors Sells 35,263 Cars and Trucks in 2 Months—50 Per Cent Increase

NEW YORK, Oct. 30—The General Motors Corp. during the months of August and September sold 50 per cent more cars and trucks than in the corresponding period in 1916. The sales for the 1917 period were 35,263, valued at $35,168,000, compared with 24,936 cars and trucks in the 1916 period, valued at $21,480,767.

Undivided profits during August and September amounted to $6,375,000 as against $4,371,475 in the corresponding period of 1916. The cash in banks and in sight drafts, at this date amounts to approximately $21,600,000.

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50 Doble Steamers Under Way

DETROIT, Oct. 29—The General Engineering Co. is now placing fifty Doble steamers through production to supply their dealers throughout the country, after which regular production will be started.

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Chevrolet Sales Increase 87 Per Cent

NEW YORK, Oct. 30—In its statement to the stockholders, the Chevrolet Motor Co. reports an 87 per cent increase in its sales for the 9 months ending Sept. 30, 1917. During that period 95,084 cars valued at $46,178,325 were sold, as compared with 51,070 cars valued at $24,703,720 in the corresponding period of 1916.

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Altree Resigns from Bosch

NEW YORK, Oct. 31—A. H. D. Altree, one of the pioneers in the magneto field, has resigned as vice-president of the Bosch Magneto Co., his resignation taking effect Jan. 15. He has been in the main office here since 1914, having been transferred from the Chicago branch where he was manager. Mr. Altree was at one time general manager of the Daimler Motor Co., Coventry, England.

Retail Car Sales Not Taxable

Cars Held for Retail Sale by Wholesaler-Retailer Exempt If Handled Separately

WASHINGTON, Oct. 31—New cars and trucks which dealers had on their floors October 4 and have been holding for retail sale are not taxable if the dealer does only a retail business or where a dealer doing both wholesale and retail business maintains his wholesale department entirely separate. Although the Treasury Department has previously made a preliminary ruling that all cars and trucks held for sale on and after October 4 should be taxable at 1½ per cent regardless of whether they were to be sold at wholesale or retail, a subsequent ruling has changed this situation. Following are the latest rulings made by the Treasury Department:

1—Any dealer or distributer who completes a vehicle and offers it for sale is subject to the 3 per cent tax. This applies to a dealer adding a new body to a chassis or any person converting a touring car into a truck by adding an attachment.

2—Trucks and cars sold to the Government will not be tax exempt. Manufacturers to get the tax must add it to the price of the goods before selling to the Government.

3—A dealer who is both a wholesaler and retailer and handles two different makes of cars under two separate contracts, with one contract providing for retailing only, is exempt from the floor tax on cars under the retail contract, but he pays the tax on all cars on his floor under the contract were he a wholesaler and retailer without separate contracts.

4—Those car manufacturers selling through branches and whose branches are a part of the parent company and not separate corporations must pay the 3 per cent tax on the sales price received whether wholesale price or list price.

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$30,000,000 Ordnance Order for Dodge

DETROIT, Nov. 1—Dodge Brothers have received a $30,000,000 contract for ordnance from the war department. John and Harris Dodge are financing the undertaking without outside aid. A 40-acre site for a factory was purchased some time ago at Lynch Road and Mt. Elliot Avenue. Ground was broken yesterday morning. It is planned to be in operation early next year and employ 8000 men. This plan supersedes the one to use the half finished Saxon plant, which will be completed.

1918 Tractor Tests More Thorough

One Continuous 10-Hr. Demonstration — Detroit or Cleveland for Tests

CHICAGO, Oct. 27—There will be a national tractor demonstration in 1918 and the test will combine fuel consumption, tractive efficiency, belt work, and other questions of tractor efficiency, none of which entered into the demonstrations held the past year at Fremont, Neb. This decision to hold real tests was decided upon at a meeting of the national tractor demonstration committee, which is a committee of the Implement and Vehicle Association, the organization that supervised demonstrations this year. These new recommendations come as a natural result of the tests in August, which furnished scarcely any tangible information of value to buyers and others concerning tractor performances at the demonstration.

According to the opinion of the committee, the 1918 tests will include the following:

1—Tests on fuel in plowing and performing other kinds of farm work.

2—Tests of different types of traction wheels, wheel equipment, and tractive efficiency, to include tests running wheels in furroughs, on unplowed ground, and also on plowed ground. This will furnish information as to the relative merit of tractors with different numbers of wheels.

3—Tests on steering mechanisms.

4—Tests of tractors doing belt work.

In addition to these specific tests the committee decided that each tractor should give one continuous 10-hr. demonstration. Last August the tractors demonstrated about as they saw fit, and as there was no endurance test, such as a 10-hr. test would prove, there was no opportunity of getting a definite line on the relative value to the tractors.

The location of the demonstrations for 1918 has not been determined upon, but the committee favors some point in the vicinity of Detroit or Cleveland, providing 3000 to 5000 acres of land can be secured. This apparently bears out the idea that Fremont is not well located as a demonstrating ground from the manufacturers' viewpoint; and further that these demonstrations are really for manufacturers rather than buyers.

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Smith-Hudford Merger Denied

NEW YORK, Oct. 30—Rumors that the Smith Motor Truck Co., Chicago, making the Smith Form-a-Truck, and the Commercial Car Unit, Philadelphia, making what was the Hudford attachment, have been merged are discounted by Charles E. Danforth, a banker of this city and one of the members of the Smith creditors' committee. Danforth states that such a suggestion was made by one of the creditors, but was not accepted, and is doubtless responsible for the rumor.

The Smith company, Danforth states, is doing well since the formation of the creditors' committee; this committee has advanced $100,000 to pay off all the small creditors and the company is producing. Thursday, Oct. 25 it received orders for 187; Friday, eighty-nine, and Saturday, sixty-two. He states as his belief that the company will pull out of its difficulties.

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No Special Type of Tractor for Great Britain

LONDON, Oct. 15—There is no truth in the report that the British government has approved any special types of farm tractors which report has been current for some time. It is a fact, however, that orders in considerable quantities have been placed with many tractor makers. No tests have been made in connection with placing these orders. Generally the tractors were ordered in small quantities at first and if they proved reasonably satisfactory orders in increased quantities were placed. All orders were placed by the Board of Agriculture or the Food Production Department. The necessity for securing the machines quickly did not permit of any extended trials of the machine. The Ford machine was, however, tested by the Royal Agricultural Society of England but no tests were made of other makes. Among the different tractors which have been ordered in varying quantities, are: Ford, Titan, Mogul, Samson, Sandusky, Emerson, Agrimotor, Saunderson, and a creeper type. Several of the latter machines are English products.

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Britain to Hold Tractor Trials in 1918

LONDON, ENGLAND, Oct. 31—The great interest in farm tractors and the necessity for tractors in order to increase agriculture in England with diminished labor has led to the decision to hold in August, 1918, very extensive tractor trials which will rival in technical nature the famous reliability trials of automobiles held in England many years ago. It is proposed in these 1918 trials to test the tractors in many ways and obtain complete records of their performances.

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Metropolitan Section Discusses Aerial Warfare

NEW YORK, Oct. 26—At the first meeting of the season of the S. A. E. Metropolitan Section held at the Automobile Club of America, last night, G. Douglas Wardrop read a paper on the War in the Air, which was illustrated by moving pictures. Some of the pictures shown were of one of the large English Handley-Page biplanes and this was really the most interesting part of the program. The men were seen climbing into the machine, which gave a good idea of its enormous size, and part of the reel had been taken from the machine in the air, while it was being followed by another machine, which simulated an attack, flying soon below and soon above the Handley-Page, thus giving a vivid impression of conditions aviators have to contend with on the battle front. Another reel showed dirigibles at Salonika.

Six Months' Gasoline Supply in England

Licenses in Form of Vouchers —No Price Cutting—Present Quotation 92 Cents

LONDON, ENGLAND, Oct. 15—The new series of gasoline licenses to be used in England beginning with Nov. 1 will, it is expected, cover a 6 months' supply of fuel. The licenses will be in the form of a book of vouchers, each voucher entitling the holder to 1 gal. of gasoline. Should the motorist want 20 gal. he must deliver to the garageman twenty vouchers. The garageman must in turn deliver these twenty vouchers to the oil company furnishing him with gasoline before he can renew his supply.

At present the sale of even 1 gal. of gasoline to a motorist at less than the price fixed by the government renders the garageman liable to all the penalties of the Motor Traders Association. The major punishment is that of being placed on the "stop list," which makes it impossible for the garageman to purchase any standard supplies of accessories, etc. Price cutting on gasoline is practically unknown in England. The price of gasoline is somewhat lower than it was the first of the month, there having been a reduction of 6 cents per gal. in the selling price to the public early in October. At present the public pays 92 cents per gal., and the dealer pays 79 cents per gal.

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Minneapolis Section to Discuss Tractor Demonstrations Nov. 7

MINNEAPOLIS, MINN., Oct. 30—The Minneapolis Section, S. A. E. has established an office at 541 Plymouth Avenue, for the convenience of committees and carrying on the business of the Section. The room will also be used as general headquarters and for general information purposes.

The Meetings and Papers committee have already arranged for the monthly meetings for the entire coming season up to and including May 1, 1918. The meetings will occur in the evening of the first Wednesday in each month in the Empire room or the Gold Room of the Radisson Hotel.

The first meeting occurs, Wednesday evening, Nov. 7, at 8 o'clock, at which meeting a paper will be read by O. B. Kinnard, of Minneapolis, who will speak on "Future Tractor Demonstrations."

Subjects for the following meetings will soon be announced. A general invitation to all interested in the tractor industry to attend the meetings is extended by the association.

The Minneapolis headquarters will hereafter be the meeting place for the Society Tractor Standard Committee.

The following are the officers of the Minneapolis Section: Chairman, E. R. Greer; vice-chairman, W. J. McVicker; secretary, H. C. Buffington, treasurer, J. S. Clapper.

W. F. Bradley In Air Service

Now Technical Expert for American Aviation in France

PARIS, FRANCE, Oct. 1.—W. F. Bradley, for years special European representative of AUTOMOTIVE INDUSTRIES, has been signally honored by being offered a position as technical expert at the American Aviation Headquarters in France. Mr. Bradley has accepted the position. No one is better qualified for such a position than Mr. Bradley because he has followed aviation development from its inception in Europe and has lived with it in the French capital. Not only has he been familiar with all of the activities in the French aviation factories but he has recently made two visits to the Italian factories in his service connected with AUTOMOTIVE INDUSTRIES. He has had entrée to all factories in France, Italy and England for many months, and while his articles have told of the general development of aviation, his experience has given him much information of a confidential nature which could not be published.

It is a signal mark of distinction that it was an article by W. F. Bradley which drew the attention of America to the necessity of standardizing the aviation engine and which resulted in Major Jesse G. Vincent, then plain Jesse G. Vincent, Packard engineer, coming to the conclusion that if America was to get into the war and do her part in aviation she would have to put aviation engine production on a new plane. This resulted in Mr. Vincent's going through Mr. Bradley's article very carefully and concluding that if France had thirty-four different aviation engine models the United States must immediately get busy developing one standard engine. This was the real inception of the Liberty engine. Within six hours after reading Mr. Bradley's article Mr. Vincent started for Washington to lay the foundation for what is now the Liberty engine.

Since the outbreak of the war Mr. Bradley has been constantly in military service. In the fall of 1914 he spent most of his time driving officers' cars on the French, English and Belgian fronts. Later he had very extended experience as ambulance driver with the Italian army and for months was located in the city of Gorizia, where he was constantly operating in advance of the heavy Italian artillery and where he was under constant fire from the long range Austrian guns. At that time he made a very careful study of the Italian motor truck equipment as well as their ambulance service, and his many articles have made up the best contribution to motor war literature that has yet been published. His articles on organization of motor truck units and also ambulance units have been particularly constructive.

In his new field of aviation Mr. Bradley is still closer coupled with his American reading clientele and his many articles give a coloring to the motor in the war which cannot be had in any other way.

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Moto-Pep Tested by A. A. A.

INDIANAPOLIS, IND., Oct. 27—The first official economy and acceleration tests in which equipment recommended by the Society of Automotive Engineers has been used were made in determining the value of a combined fuel energizer and carbon remover called Moto-Pep. The tests were sanctioned by the American Automobile Assn., supervised by Chester Ricker, technical representative of the A. A. A., on a Maxwell Oct. 17 to 21. At speeds from 15 to 40 m.p.h., the increase in economy for the Moto-Pep mixture ranged from 10½ and 20 per cent. At a speed of 10 m.p.h. the gasoline alone gave 19 m.p.g., and the Moto-Pep mixture nearly 30, but at speeds immediately above and below this, the records show less economy for the Moto-Pep mixture.

These tests were at a temperature of 50 deg. Fahr. But on a warmer day at 80 deg. Fahr., when gasoline was alone tested, the Maxwell car showed 27½ m.p.g. at all speeds from 18 to 26 m.p.h. Acceleration for both fuels was the same at all speeds as determined by Gallup's electrical recording apparatus. Moto-Pep is a liquid designed to increase the fuel value of gasoline and was used in proportion of one-fifth ounce per gallon of gasoline.

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Ontario Tractor Hire on New Scale

TORONTO, ONT., Oct. 29—Farmers in Ontario, who have been using Government tractors on their farms, will soon be charged for their hire under a new schedule. The Ontario Department of Agriculture, which has 135 tractors at work on the farms, has suggested that instead of charging a flat rate per hour it might be better to charge a flat rate per acre in addition to so much per hour.

The proposed new charge is 25 cents an hour, plus 80 cents per acre.

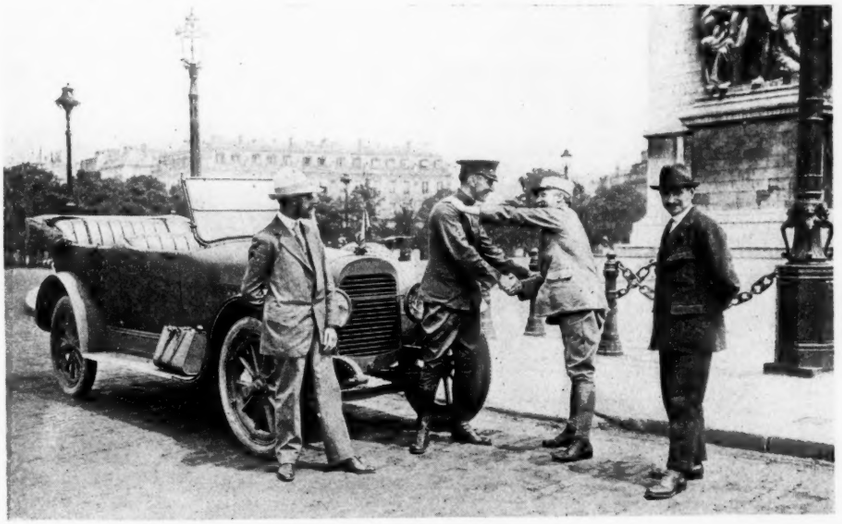
Australian Dealers Hit Hard

Embargo Against Import of Chassis with Bodies Creates Big Scarcity

SYDNEY, AUSTRALIA, Sept. 25—The embargo against importing of automobile chassis with bodies, which was put into effect Aug. 10, has been creating great injury to automobile dealers in Australia, due to the fact that there is not sufficient body building capacity in Australia to furnish the necessary bodies for the chassis which the dealers can sell. Because of this situation the government modified the original ruling permitting the fitting of cowl dashes, footboards, mudguards, windshields, hoods, and other parts and admitting them as a part of the chassis. A still later modification permitted of shipping a percentage of chassis with bodies. This has not met the requirements and it is estimated that it will be 12 to 18 months before body builders in Australia will be in a position to furnish all bodies needed. In the meantime dealers are confronted with the problem of perhaps having their money tied up with chassis which they may carry in stock for a year or longer until such time as bodies can be secured.

Many overtures have been made to the Australian government by the dealers drawing attention to the great expense it will place on them due to not being able to get bodies. But the body builders in Australia are facing other difficulties than mere lack of capacity. They started using steels not suited for body construction, as the metal cracked and failed to withstand ordinary use. The lack of shipping space is already seriously handicapping the body-building trade.

Some interesting information has been furnished on automobile conditions a year ago. The second half of 1916 being especially wet, buyers deferred their pur-



W. F. Bradley on left introducing Eddie Rickenbacker to Duray and Chassagne, the French racing drivers

chases until the roads were in good condition. The farmers were not advised until a late date concerning the government's intention in payment for the 1917 crop, and held out purchasing until this was settled. The government took over the wool clip and stock farmers deferred purchasing of cars until wool prices were announced. To this might be added the coal strike in November.

The natural consequence of these delays came with a rush of business in the first quarter of the present year, which made up for the slump of the previous year. Many dealers soon found themselves out of stocks. It has been due to the many overtures made by the Australian dealers that the government has recently modified its rulings with reference to the embargo and additional modifications may be expected.

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Apperson Tourster Ready Dec. 1

CHICAGO, Oct. 29—The Apperson Motor Car Co., Kokomo, Ind., will bring out about Dec. 1 a new four-passenger job to be known as the Tourster. This will be somewhat different from the present Appersons, although the main difference will be in body. A more detailed description of this new job will be given about a month hence, when deliveries begin.

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Monroe Sedan $965

PONTIAC, MICH., Oct. 29—The Monroe Motor Car Co. is now manufacturing a sedan which is mounted on the smaller of the two Monroe chassis and sells for $965.

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Crow-Elkhart Chassis Little Changed—Five New Models

ELKHART, IND., Oct. 30—The Crow-Elkhart Motor Co. will have five models in its new line. These are a five-passenger touring car at $935; a four-passenger DeLuxe cloverleaf roadster at $995; a five-passenger DeLuxe touring car at $995; a convertible coupé at $1,195 and a convertible sedan at $1,275. Wire wheels are $100 extra on all models. These new models will be styled series K and deliveries are being made to dealers.

Though the chassis is practically unchanged the cars are improved and refined. The principal elements are a unit power plant with a 3½ by 5 engine and Borg & Beck clutch. Thermoid flexible universals are used. A Zenith carbureter is fed from a Stewart vacuum tank and the electrical equipment is a two-unit Dyneto system, with Willard batteries and Connecticut ignition. The wheelbase is 114½ in., wheels being shod with 32 by 3½ in. tires. Rear springs are elliptic.

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Briscoe Doubles Production

JACKSON, MICH., Oct. 24—The Briscoe Motor Corp. has increased its production from twenty-five or thirty cars per day to fifty or sixty per day, and has increased its organization slightly. It is stated that this increase has been necessitated from an increased gain from the southern section where light cars seem to be badly needed.

Women Employees Increase in Detroit

Three Times as Fast as Men—Payrolls at Factories Now 17.6% Higher Than 1916

LANSING, MICH., Oct. 23—Although there has been a great increase in the number of men employed in Detroit factories and workshops, the women so employed are increasing almost three times as fast as the men, according to statistics compiled by Labor Commissioner Richard H. Fletcher, in factories employing more than 500 persons.

Comparing the payrolls of the factories mentioned as of May, 1916, and May, 1917, Mr. Fletcher finds that the increase in male employees was almost 7 per cent, while the increase in the number of women employed in the same factories was 17.6 per cent.

In 1916 these factories employed 82,359 men and 6029 women. In 1917 the same factories employed 88,125 men and 7095 women.

The gain in women is shown in the higher positions. In 1916 there was but one female superintendent; now there are two. In 1916 there were forty-four foreladies; in 1917, sixty-four. Under the age of 16 in 1916 there were seventeen girls employed; in 1917 there were forty-six. Of those more than sixteen the factories in 1916 employed 1725 women in offices, while this year there were 2160. The other women employed in 1916 numbered 4242 and this year 4813.

The men employed, numerically speaking, showed these increases: Superintendents, twenty-five; foremen, 641; boys under 16, eighteen; unskilled labor over 18 years of age, 5664. There was a decrease of one in the number of boys between 16 and 18 years of age; a decrease of twelve in men over 18 employed in offices; and a decrease of 569 in skilled males over 18 used in skilled labor.

Despite this decrease in the latter line there was an increase in the aggregate daily wages paid skilled labor over 18 amounting to $33,067.43. The unskilled labor received $31,947.77, more daily this year than was paid in 1916.

In the total daily wages paid women all classes show increases. For superintendents the increase is $3.20. For foreladies, $45.25; girls under 16, $51.60; over 16 in offices, $1,438.98; women over 16, $1,748.10.

The total number of men and women employed in the factories as returned to the department in 1916 was 88,388, and in 1917, 95,220. The total daily wage for all in 1916 was $284,071.99, and in 1917, $355,942.88.

"While this comparison shows a big increase in the number of women employed," said Chief Clerk Maurice D. Kirby in making the table public, "a comparison with the payrolls as of May 1, next, will show increases which will be astounding. I doubt very much if the general public has any idea of the number of women who have gone to work in the factories and workshops in Michigan since the war began."

Labor Commissioner Richard H. Fletcher gives the following comparative figures as to men and women workers in Detroit factories and workshops employing over 500:

	May 1916	May 1917	Increase Per Cent
Men	82,359	88,125	7.0
Women	6,029	7,095	17.6

Total number of men and women employed in factories:

1916	1917
88,388	95,220

Total daily wages in factories:

1916	1917
$284,071.99	$355,942.88

The number of women in factories compared in 1916 and 1917:

	1916	1917
Female superintendents	1	2
Foreladies	44	64
Under 16	17	46
Over 16, in offices	1,725	2,160
Other women employed	4,242	4,813

Men employed, numerically speaking, showed these increases:

Superintendents	25
Foremen	641
Boys, under 16	18
Over 16, unskilled labor	5,664

There was a decrease in:

Boys between 16 and 18	1
Over 18, in offices	12
Over 18, skilled labor	569

In total daily wages paid women, all classes show increases:

Superintendents	$3.20
Foreladies	45.25
Girls under 16	51.60
Over 16, in offices	1,438.96
Over 16	1,748.10

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$10,000,000 Automobile Plant for New Mexico

TEXICO, N. M., Oct. 26—Plans and specifications are being drawn for an automobile factory which is to be erected here at a cost of $10,000,000. The establishment of this new industrial plant is being promoted by C. A. Roberson of Texico and associates. It is stated that enough stock has already been subscribed to insure the construction of the factory along lines originally planned and that the contract will be let soon. In selecting Texico as the site for the proposed plant the promoters had in mind the fact that there is a large and increasing demand for automobiles in the Southwest, including Texas, New Mexico, Arizona and Oklahoma. No formal announcement has as yet been made as to the type of car that is to be manufactured by the company which is now in process of organization.

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Cadillac Truck Adds 4-Tonner

CADILLAC, MICH., Oct. 27—The Cadillac Auto Truck Co. has added a 4-ton model to its line which now includes 1-, 2- and 3½-ton models as well. The new truck will be styled model D and is similar to the others. It has a Continental type E engine with Rayfield carbureter and Stewart feed and Eisemann magneto. Transmission elements include a three-speed Cotta gearset and Timken axles. The wheelbase is 168 in. and the loading space 156 in. Front tires are 36 by 5 single and rear 40 by 5 dual. The price of the chassis is $3,700.

Industrial Review of the Week

A Summary of Major Developments in Other Fields

Expect More Steel Price Fixing

EVENTS continue to show that the War Industries Board is taking a minor position in price fixing. A list of extras to apply to bars, shapes and plates has been announced through a subcommittee of the American Iron and Steel Institute, and the general committee of the institute and its subcommittee chairmen are now in session in New York to settle finally the price question on products not yet fixed. It is doubtful if a conclusion will be reached at the one conference, but the situation now points to a clearing of the atmosphere of uncertainty in a matter of days.

The whole movement indicates that a broad spirit of confidence is reposed in the representatives of the steel makers. The trade may accordingly expect schedules of prices with spreads commensurate with those of the prices already established. Like the extras just promulgated, recognized trade practices will undoubtedly be followed, even to adopting, as in this case, the minor departures which the special demands coming originally from Europe brought into being.

Meanwhile prices have been dropping toward levels which are regarded as marking the new maxima. Blue and box annealed sheets are now abtainable at 3c. per pound less than in late September and galvanized sheets and tin mill products at 2c. less. Last week cold-rolled strip steel fell from 9c. to 7c. per pound. On Government business, to be sure, but also indicating the tendency, about 4000 tons of rivets were sold at $5 to $7 below regular quotations.

Buying of pig iron is not very active on account of the unwillingness of furnaces to take on additional tonnages. As the weeks pass the scarcity of iron for delivery this year and in the first quarter of next is being emphasized. Southern furnaces are especially conservative. They believe that all the iron which Northern furnaces can possibly furnish will soon be sold and that then there will be no difficulty in disposing of the Southern product, which in competitive markets would have to be moved at less than the maximum price set. During the past week there has been fair buying of basic, Bessemer and foundry grades in the Pittsburgh district at Government prices.

The coke situation continues to annoy furnace operators and more of them are in danger of being compelled to bank on account of inadequate supplies. The fuel administrator has agreed to apportion the supply of coke according to the amount of business in hand for the Government. A meeting has been called for Thursday to smooth out the question of steel supplies to the automobile trade. —*Iron Age.*

A New Service

¶ Herewith THE AUTOMOBILE AND AUTOMOTIVE INDUSTRIES *supplies for the benefit of its readers a general summary of important developments in other fields of business. This is rendered possible by the editorial cooperation of leading industrial publications which are recognized authorities.*

By compressing the general industrial situation into this form we hope to give our readers a clear and comprehensive idea of up-to-the-minute developments which they could otherwise secure only with considerable expenditure of time and effort.

Rubber Prices Reach Bottom

NEW YORK, Oct. 30—Rubber prices in the local market have about reached bottom. An active buying movement is expected as a result. Rubber arrivals have been good and when the demand sets in there will not be much trouble in getting the product. Quotations here are around 64 cents a lb. on spot first late crepe, with 62 cents for smoke sheets.

Ford Loses to Dodge Brothers

(*Continued from page* 776)

Ford company; Henry Ford himself, however, may build the furnaces.

When it was first proposed by the Ford Motor Co. that immense blast furnaces be built to produce much of the material going into the make-up of Ford cars, trucks and tractors, Dodge Brothers, who are minority stockholders in the Ford company, applied for a permanent injunction restraining the Ford company from building them and protesting against the proposal to use undivided profits for this purpose.

Ford was permitted to begin construction of the furnaces by the State Supreme Court, however, upon filing a bond to protect stockholders in case Dodge Brothers lost their suit. Work was accordingly commenced.

The decision also holds that the Ford Motor Co. is not a monopoly within the lines forbidden by the Sherman anti-trust law.

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Brass Companies in Merger

WATERBURY, CONN., Nov. 1—The Connecticut Brass Corp. and the Pilling Brass Co. have been merged into a company to be styled Connecticut Brass & Mfg. Corp. It will be capitalized by the issue of $600,000 two-year convertible notes; $600,000 in preferred stock; $400,000 second preferred and $2,000,000 common. The new company will have a capacity of 2,500,000 lbs. of finished brass a year. The Connecticut Brass Corp. was formed in 1916, John E. Liggett being president; A. J. Drexel, Jr., vice-president, and Alden S. Hichborn, secretary and treasurer.

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Stewart-Warner at Both Shows

NEW YORK, Nov. 1—The Stewart-Warner Speedometer Corp. will exhibit at both the New York and Chicago National shows. Through an inadvertence the name was omitted from the previously published list of exhibitors.

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1918 Grant Production Soon

CLEVELAND, Oct. 29—The Grant Motor Car Co. will start production on the 1918 series in a short time. The development of the new model is completed, and it will cost more than the present one. About 125 cars remain on the 1917 manufacturing schedule.

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Saxon to Raise $700,000

DETROIT, Nov. 1—The Saxon Motor Co., according to a statement from President Harry Ford, requires an additional $700,000 and this is to be raised from a bond issue covering the Saxon plant as it now stands. Creditors are to receive a 10 per cent dividend Nov. 1 and 10 per cent Feb. 1, the remainder being extended to August 1, 1918.

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Champion Spark Plug Adds

TOLEDO, Oct. 30—The one-story brick building now occupied by the F. Bissell Co. is to be converted by the Champion Spark Plug Co. into a machine shop, accommodating from seventy to eighty automatic screw machines. The adjoining warehouse will be utilized for steel and raw materials storage. The plant of the City Foundry Co. will be combined with the steel drawing mill, increasing the capacity there to 100 tons per day. In addition 4 acres south of the present factory buildings have been purchased for future factory expansion.

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Firestone Fighting Tire Abuse

NEW YORK, Oct. 29—The Firestone Tire & Rubber Co. is starting a movement through publicity and moving pictures under the caption: "Stop Abusing Your Tires and Save 100 Million Dollars a Year Which Means 30 Per Cent of Your Tire Expense."

—

American Plant for Russell

MONTREAL, Nov. 1—The Russell Motor Co. is to build a plant in Buffalo and is now negotiating for the property. An American subsidiary probably will be formed.

Chandler Earns $30 a Share

Jan. 1 to Oct. 1 Business Shows Large Increase Over 1916 Period

CLEVELAND, Oct. 26—The Chandler Motor Car Co. reports net profits for the period from Jan. 1, 1917 to Oct. 1, 1917, as $2,110,000, equal to $30 per share, as against $1,339,000, equal to $19 per share, for the corresponding period of 1916.

The increase of cars shipped during the 1917 period amounted to 33 per cent over a year ago.

Total quick assets amount to $4,919,774, against which there are only $802,741 in quick liabilities and of this $210,000 is the dividend requirement.

A comparison of the balance sheets up to Sept. 1 and Oct. 1, follows:

Assets

	Sept. 1	Oct. 1
Cash	$1,265,885	$974,466
Liberty bonds	278,576	251,933
Accounts receivable	284,138	307,426
Inventories	3,552,639	3,385,949
Plant and equipment	491,882	638,541
Other assets	95,182	100,370
Good will	5,000,000	5,000,000
Total	$10,968,302	$10,658,685

Liabilities

	Sept. 1	Oct. 1
Capital stock	$7,000,000	$7,000,000
Accounts payable	1,102,071	672,741
Reserves	182,862	175,440
Surplus	2,683,369	2,600,504
Total	$10,968,302	$10,658,685

—

Franklin Business Normal

SYRACUSE, Oct. 30—The H. H. Franklin Mfg. Co. is operating at normal capacity and is not experiencing difficulties as to materials or men, according to a statement from president H. H. Franklin. War conditions have not had any detrimental effect.

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$2,700,000 Business for Hoover Bearing

ANN ARBOR, MICH., Oct. 24—At the annual meeting of the Hoover Steel Ball Bearing Co. it was reported that business for the past year exceeded $2,700,000. It was voted to stop all dividend payments for some time, and it was estimated that the war tax will approximate $300,000. L. J. Hoover was re-elected president and general manager; F. A. Stivers, vice-president, and M. J. Fritz, treasurer.

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Willys-Overland Earnings for 1917 Estimated at $9,000,000

NEW YORK, Oct. 29—It is estimated that Willys-Overland will earn in the neighborhood of $9,000,000 for 1917. The third quarter of the year was big both as regards sales and profits, but the final 3 months, owing to smaller shipments, changes in inventory to care for the new car, and factory rearrangement necessary for the Curtiss Aeroplane company and new car operations, will not be a very big factor in the net earnings.

The Willys-Overland plant is doing considerable work on parts for airplane engines such as camshafts and crankshaft forgings, castings, etc. The assembling is being done in the Elyria plant of the Curtiss Aeroplane and Motors Corp.

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$539,755 Net for Hendee

SPRINGFIELD, MASS., Oct. 30—Net profits of $539,755 are reported by the Hendee Mfg. Co. for the fiscal year ending Aug. 1 last. After allowing $154,056 for preferred dividends and $150,000 for sinking fund reserve, surplus was $235,702. Profit and loss surplus was $1,142,250.

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Scripps-Booth Increases Capital

NEW YORK, Oct. 30—The Scripps-Booth Corp. is increasing its capital from 70,000 shares of no par value to 120,000 shares. It is offering stockholders the privilege of subscribing at $8 per share on or before Nov. 1 to new stock in ratio of 11-10 new shares for every share held. In addition to new 50,000 shares, 13,000 shares of original stock, unissued, is being offered.

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Receiver Appointed for Ross

DETROIT, Oct. 25—B. F. Everitt has been appointed permanent receiver of the Ross Automobile Co. and is now taking inventory. The business and factory may be sold, permitting the payment dollar per dollar to the creditors.

H. F. Howland, of the Ross Engineering Dept., has resigned. He was formerly with Hudson.

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Drexel Motor Car Assets Sold

CHICAGO, Oct. 26—The entire assets of the Drexel Motor Corp. have been closed out at auction. The property was valued at $122,410. A plan for refinancing the company was suggested to the creditors, but was unsatisfactory. The Drexel Motor Car Corp. was formed in July, 1916, to succeed the Farmack Motor Car Corp. It was capitalized at $2,000,000.

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Stewart-Warner Balance Sheet

CHICAGO, Oct. 30—The balance sheet of the Stewart-Warner Speedometer Co., as of Sept. 30, 1917, compares as follows:

ASSETS.

	Sep. 30, '17.	Dec. 31, '16.	*June 30, '16.	Dec. 31, '14.
Real estate, buildings, etc	$2,873,705	$2,574,165	$1,720,774	$967,997
Patents, good will, etc	9,134,806	9,132,968	9,096,968	9,093,313
Inventories	2,997,028	2,166,843	1,840,463	793,750
Accounts receivable	1,347,298	1,368,658	1,158,767	537,433
Cash	294,006	91,183	455,564	551,514
Deferred charges	109,017	56,460	154,158	16,703
Total	$16,756,763	$15,390,277	$14,426,694	$11,960,710

LIABILITIES.

Preferred stock	.....	.....	$724,400	$862,300
Common stock	$10,000,000	$10,000,000	10,000,000	10,000,000
Current liabilities	1,170,932	1,194,834	420,318	132,512
Special reserve	.....	.....	1,070,691	
Surplus	5,585,830	4,195,441	2,211,286	965,898
Total	$16,756,763	$15,390,277	$14,426,694	$11,960,710

*A balance sheet as of Dec. 31, 1915, was not made public.

$15,000,000 for Goodrich

Issue of 6 Per Cent Notes To Take Care of Outstanding Indebtedness

NEW YORK, Oct. 26—In order to take up its outstanding indebtedness, the B. F. Goodrich Co. will issue $15,000,000 of 6 per cent notes to cover a period of 2 years. The issue will be in serial form and will facilitate the carrying of unusually large inventories of raw materials made necessary by the war. There will be no public offering of the notes.

The company is earning more during the present half than it did in the first 6 months of 1917. Net in the first half of the year amounted to $5,200,000. Net for the whole year is expected to reach $10,500,000.

The war tax will cost the company somewhere between $1,000,000 and $1,500,000. Using the $1,500,000 figure would leave $9,000,000 net for 1917.

Preferred dividends will take slightly over $1,800,000 this year, which would leave $7,200,000 for the $60,000,000 common stock. This is equal to $12 a share for the junior issue. In 1916, without any special war taxes, Goodrich earned $12.76 a share on the common.

Net earnings of $7,200,000 for the common stock, as estimated for this year, compare with $7,657,000 in 1916; $10,317,000 in 1915; $3,371,000 in 1914, and $668,164 in 1913.

Sales in the current year are running at an annual rate of better than $85,000,000, as compared with $70,990,782 in 1916, and $55,416,866 in 1915.

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Packard Profits $5,400,691

DETROIT, Oct. 31—The annual report of the Packard Motor Car Co. shows profits of $5,400,691, current assets of $28,732,014. The property investment, less depreciation, is $14,814,029. Net surplus is $9,311,541. The directors were all re-elected.

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DIVIDENDS DECLARED

Ford Motor Co. of Canada has paid no regular dividends during the past year. The directors, however, have authorized distribution of 5 per cent Oct. 15 to stock of record Oct. 10. The purpose of this

move is to conserve the resources of the company in order to meet any needs that may arise from war conditions.

Stewart-Warner Speedometer Co., quarterly of 1½ per cent on common, payable Nov. 15 to stock of record Oct. 30. Books close Oct. 30 and reopen Nov. 6.

Prest-O-Lite Co. $2 a share, payable Oct. 31 to holders of record Oct. 20.

Fisher Body Corp. quarterly of 1¾ per cent on preferred stock, payable Nov. 1.

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Motors Appliances Locates in East Moline

EAST MOLINE, ILL., Oct. 30—The Motors Appliances Co., Seattle, Wash., has purchased the old Fuller-Lee disc factory on Tenth Street in East Moline, and will shortly commence the manufacture of a speed signal device. Other automobile accessories are to be manufactured. Officers of the new company are the following: President, W. H. Holzinger, Geneseo, Ill.; vice-president, L. H. Hawley, Chicago; secretary, G. L. Rowe, East Moline, Ill.; treasurer, J. C. Lang, Moline. The company is incorporated in the State of Washington for $200,000.

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Cardell Tractor Moves to Florida

LANSING, MICH., Oct. 30—The Cardell Tractor Co., formerly of St. Louis, Mo., in which R. E. Olds is interested, will be moved to Oldsmar, Fla. This company was organized by the Cardell Co. of St. Louis, Reo distributor, and the change of location was made to permit subsequent expansion.

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Jones Increases Capitalization

WICHITA, KANS., Oct. 30—The Jones Motor Car Co. will increase its capitalization from $500,000 to $2,500,000.

Automotive Issues Weak

Little Market for Securities —Packard Stock Back to Normal

NEW YORK, Oct. 30—Contrary to expectations, the market did not respond to the favorable report on the Liberty loan. It was thought that there would be a change for the better as soon as the Liberty loan work was completed. Yesterday's prices show that expectations were wrong and that stock prices, especially automotive and allied issues, will need a little more attention from the bulls to bring them back to any kind of a favorable position.

Packard stock featured the automobile activities last week, and was brought back to a normal quotation. When the stockholders heard that 100 shares had been quietly unloaded on the market last week, it was not long before these were taken in, resulting in raising the quotation to its normal position.

The rest of the stocks were weak and in little demand. There were a few but unimportant gains.

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Alliance Tire Stock Salesmen Under Arrest

NEW YORK, Oct. 27—New developments in the affairs of the bankrupt Alliance Tire & Rubber Co., Alliance, Ohio, have been brought to light as the result of evidence obtained by the National Vigilance Committee of the Associated Advertising Clubs of the World, which has caused the arrest of three members of a company selling the stock of this concern. They are charged with having used the mails to defraud.

Yesterday Warren C. Daniel and two of his salesmen were placed under arrest on charges of frauds amounting to $160,000, in connection with the sale of stock of the bankrupt company. Sometime ago the advertising association issued a pamphlet that charged Daniel and his associates with making false claims in advertisements about the factory operations of the Alliance company, making false statements of profits, about bonded indebtedness and publishing deceptive advertisements regarding earnings.

Investigation of conditions at the company's factory, disclosed the fact that the building marked B in the advertisements, did not exist. In the building marked A, only one man was found on the second floor working on a tire, and only one man was found in the basement making repairs on a casing which had been sent back for adjustment. There were no other men in the building.

The Alliance company was incorporated in 1916 under the laws of Delaware for $2,500,000, a reincorporation of the Alliance Rubber Co., formed in 1913 with a capital of $58,000.

Daniel is said to have contracted with the Alliance company to sell $800,000 of preferred stock and is said to have received for his services $400,000 of common stock as a bonus, and $75,000 of common stock for organization work.

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Novo Engine Working Overtime

LANSING, MICH., Oct. 29—In spite of the fact of a developed output through factory additions and working forces, the Novo Engine Co. finds that it will be necessary to work overtime between now and spring in order to meet orders at present on hand.

Automotive Securities Quotations on the New York and Detroit Exchanges

	Bid	Asked	Net Ch'ge
*Ajax Rubber Co.	57	59	..
*J. I. Case T. M. Co. pfd.	..	81	..
Chalmers Motor Co. com.	3	6	+ ½
Chalmers Motor Co. pfd.	..	..	..
*Chandler Motor Co.	70	71	—2
Chevrolet Motor Co.	70	73	—8
Curtiss Aeroplane	31	30	—2
*Fisher Body Corp. com.	30	33	+5
*Fisher Body Corp. pfd.	88	91	+7
Fisk Rubber Co. com.	50	60	..
Fisk Rubber Co. 1st pfd.	100	105	..
Fisk Rubber Co. 2nd pfd.	85	95	..
Firestone Tire & Rubber Co. com.	97	100	—1
Firestone Tire & Rubber Co. pfd.	98	101	—1
*General Motors Co. com.	87	88	—8¼
*General Motors Co. pfd.	75	77	—3½
*B. F. Goodrich Co. com.	39½	40½	—3
*B. F. Goodrich Co. pfd.	99	101	—1
Goodyear Tire & Rubber Co. com.	159	162	..
Goodyear Tire & Rubber Co. pfd.	99	102	..
Grant Motor Car Corp.	2	3½	..
Hupp Motor Car Corp. com.	2¼	3	— ¼
Hupp Motor Car Corp. pfd.	82	88	..
International Motor Co. com.	9	11	+1
International Motor Co. 1st pfd.	..	50	..
International Motor Co. 2nd pfd.	15	30	..
*Kelly-Springfield Tire Co. com.	44	46	— ⅛
*Kelly-Springfield Tire Co. 1st pfd.	85	90⅛	..
*Lee Rubber & Tire Corp.	15	17	— ¼
*Maxwell Motor Co., Inc. com.	31	32	—1
*Maxwell Motor Co., Inc. 1st pfd.	63	65	—1½
*Maxwell Motor Co., Inc. 2nd pfd.	19	21	+1¼
Miller Rubber Co. com.	134	137	—6
Miller Rubber Co. pfd.	98	101	—1
Packard Motor Car Co. com.	112	120	+3
Packard Motor Car Co. pfd.	94	97	+2
Paige-Detroit Motor Car Co.	20	23	—3
Peerless Truck & Motor Corp.	10	13	..
Portage Rubber Co. com.	118	121	+2
Regal Motor Car Co. pfd.	10	20	—11
Reo Motor Car Co.	22	23	+1
*Saxon Motor Car Corp.	7	9	—1½
Springfield Body Corp. com.	..	..	..
Springfield Body Corp. pfd.	..	..	..
Standard Motor Construction Co.	8	9	..
*Stewart-Warner Speed. Corp.	58	59	..
*Studebaker Corp. com.	37	39	—3
*Studebaker Corp. pfd.	89	91	—1
Submarine Boat	16	15½	— ¾
Swinehart Tire & Rubber Co.	35	45	..
United Motors Corp.	19¼	19¾	— ¾
*U. S. Rubber Co. com.	57	58	—1½
*U. S. Rubber Co. pfd.	99	101	—2
*White Motor Co.	38	39	—2
*Willys-Overland Co. com.	19	21	—4
*Willys-Overland Co. pfd.	88	92	..
Wright-Martin	8½	8¼	—1¼

* At close October 29, 1917. Listed New York Stock Exchange.

OFFICIAL QUOTATIONS OF THE DETROIT STOCK EXCHANGE

ACTIVE STOCKS

	Bid	Asked	Net Ch'ge
Auto Body Co.	..	10	..
Bower Roller Bearing Co.	..	28½	..
Chevrolet Motor Co.	72	76	—6
Commerce Motor Car Co.	..	7½	..
Continental Motor Co. com.	5¾	6⅛	..
Continental Motor Co. pfd. (new)	..	..	..
Edmunds & Jones com.	..	31	..
Ford Motor Co. of Canada	200	214	—19
Hall Lamp Co.	..	..	..
Michigan Stamping Co. com.	12¾	13¼	+ ¼
Motor Products	..	..	..
Packard Motor Car Co. com.	125	139	+25
Packard Motor Car Co. pfd.	..	96	..
Paige-Detroit Motor Car Co.	20	23	..
Prudden Wheel Co.	14	..	—1
Reo Motor Car Co.	21¾	22½	+ ¾

INACTIVE STOCKS

Atlas Drop Forge	..	35½	..
Kelsey Wheel Co.	78	84	—4
Regal Motor Car Co.	..	26½	..

Hearne Winner of Fall Classic

McCarthy Captures 50 Lap Consolation Prize—Gaston Chevrolet Slightly Injured

UNIONTOWN, PA., Oct. 29 — Eddie Hearne this afternoon won the 150-lap, 168-miles Autumn Classic in 1:49:02.45 at an average speed of 93.75 miles per hour. Hearne's Duesenberg was the only car to make a non-stop race. After leading the field from the 73d lap, Henderson in a Duesenberg bumped into the inner guard rail on the 114th lap and was put out of the race. He was a half lap ahead of the field at the time. His team mate, Tommy Milton, was driven from first position in the 147th lap by a flat tire, but at the time held a lead of a lap and got back in the running in time to claim second position at the finish. Gaston Chevrolet and his mechanician, Sal Barbarini, were both injured to some extent in the 112th lap when the Frontenac left the track in the backstretch, tearing out several panels of guard rail in the crash. Both men were squeezed in their seats but sustained no serious injury.

Ralph Mulford held the lead with his Frontenac for one lap, the 46th, and went out permanently in the next lap with engine trouble. Gil Anderson took his Miller off the course in the 15th with engine trouble. Fred McCarthy won the fifty-lap consolation event, in which six cars were entered. He also came in a winner in the fifty-lap match race, in which Dave Lewis, in a Hoskins, and I. P. Fetterman were entered and finished in the order named.

The races were twice postponed because of inclement weather. Summaries:

Autumn classic, 150 laps, 168½ miles (average, 93.75 m. p. h.)

1—Eddie Hearne, Duesenberg.....1:49:02.45
2—Tommy Milton, Duesenberg 1:49:27.45
3—Ira Vail, Hudson 1:54:37.05
4—Dave Lewis, Hoskins.....1:55:24.03
5—Denney Hickey, Hudson.....1:56:58.11

Consolation race, 50 laps, 56¼ miles (average, 88.3 m. p. h.)

1—Fred McCarthy, Hudson.....38:20.18
2—Jack Conway, Hudson 38:20.75
3—Bobby Shoff, Haynes 42:39.58
4—Nat Fetterman, Haynes 43:43.49

U. S. A. Challenge trophy race, 50 laps, 56¼ miles (average, 93 m. p. h.)

1—Fred McCarthy, Hudson 36:12.61
2—Dave Lewis, Hoskins 36:16.79
3—I. P. Fetterman, Peerless.....36:48.34

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Johnson Would Co-operate With A. A. A.

NEW YORK, Oct. 30—A neutralizing potion seems to have been injected into the plans for organizing speedway race drivers into a body to be known as the National Grand Circuit of American Speedways. C. W. Johnson, president of the Uniontown Speedway Association, has been looked upon as the promoter of the plan, although his name has not been officially given as the controlling executive. Some of the western speedway managers were visited by Johnson last week and he outlined to them his plans, which he says are not such as to militate against the American Automobile Association, but rather are that of co-operation between that body, the American Speedways Association and the new organization.

Briefly, Johnson's plans, as nearly as can be learned now, are these: To bring together a field of twenty-eight or thirty, or perhaps more drivers, all of whom would drive under the management of the new organization, which, of course, has its rules and regulations that are strictly ironclad and provide for suspension, fines and expulsion for a violation of any of a certain list of defined infractions. This field of drivers is to be entered, furnished with cars, and financed, thus giving to speedway managers assurance of a large field of starters for each event.

Johnson says this would be helpful to the A. A. A. and the American Speedways Association instead of detrimental, and that there is nothing of the outlaw atmosphere to the proposed organization of which he is the attributed head.

There are certain objections to the plan. Granting that the new organization is not of the calibre to be branded "outlaw," and that it is to be more of a booking agency for speedway racing, with this its chief purpose, it is difficult to conceive how such an organization could have the drawing power that race entries that included such names as De Palma, Resta, Aitken, Anderson, Cooper, Louis Chevrolet and others of that standing have had. The new organization has not in its membership the name of a single speedway champion and few of those who have become more or less known in the last two years.

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Briscoe Takes Over Redden Attachment Sales

JACKSON, MICH., Oct. 31—Arrangements have been completed whereby the sale of the Redden truck attachments will be handled by the Briscoe Motor Corp., which has manufactured these units in the past. General offices have been moved from Chicago to the administration building of the Briscoe company. C. F. Redden, president and founder of the Redden Motor Truck Co., recently sold out his entire holdings and interests in the company to enter the farm tractor field.

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Defense Council in New Home

WASHINGTON, Oct. 26—The Council of National Defense has moved into its new home, an emergency war building erected for its occupancy on Eighteenth Street between C and D Streets, N. W. The building cost $500,000 and was erected in a little less than 50 days, 900 men working 10 hr. a day on it. From now on it will house all of the executive officers and the various committees, subcommittees and boards of the Defense Council.

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69,982 Fords in September

DETROIT, Oct. 25—The Ford Motor Co. is carrying a $40,000,000 government contract. Production in September amounted to 69,982 cars and 1383 trucks. Unfilled orders now on hand total 114,337 cars and 3547 trucks.

Intercity Parcel Post Planned

Initial Route Between Washington and Baltimore—To Be Extended Later

WASHINGTON, Oct. 30.—Washington is to be the radiating center for the first big experiment by the Post Office Department in interurban motor transportation of parcel post mail, the idea of the department being ultimately to extend this service between many of the cities of the country, thus bringing the producer and consumer of the essentials of life in close touch. The initial route is to be between Washington and Baltimore, a distance of 40 miles.

James I. Blakslee, fourth assistant postmaster general, has authorized the establishment of the first route. General Blakslee believes that some such solution of the transportation problem is vital to the conservation of the food supply and the lowering of the cost of living. One motor truck will leave both Baltimore and Washington at 6 o'clock each week day morning. These two trucks will meet midway, approximately, between these two cities, and also meet a third truck covering territory not reached by these two. The three will exchange their packages and start back to their respective bases, reaching there at 2.30 o'clock in the afternoon. This will give time for delivery of orders by wagons in the main cities.

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Four New Accessory Exhibitors

NEW YORK, Oct. 30—Four new accessory exhibitors have been added to the national shows. These include the Eisemann Magneto Co., Brooklyn, which will exhibit at New York only; the W. E. Tratt Mfg. Co., Chicago, at both New York and Chicago; the Menominee Electric Products Co., New York, at both shows, and the G. L. W. Spring Oiler Co., San Diego, Cal., at both shows.

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Chalmers Material Orders Being Placed

DETROIT, Oct. 30—The Maxwell Motor Co. is placing orders for the purchase of material to be used for Chalmers cars. All orders so placed are signed in the name of the "Maxwell Motor Co., Chalmers Plant."

Under the new arrangement all invoices and statements covering material delivered to the Chalmers plant are to be rendered separately and kept apart from any other account of the Maxwell company. Statements are to be addressed "Chalmers Factory Accounts," Detroit.

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Orville Wright Honored

DAYTON, OHIO, Oct. 26—Orville Wright has had conferred on him the Albert medal by Lord Northcliffe, head of the British war mission to the United States. The medal was presented by the Royal Society of Arts of England, which gives a medal each year to some one prominent in the arts and sciences of the world.

Commercial Body Corp. Will Distribute Bodies

NEW YORK, Oct. 29—The Commercial Motorbody Corp. has been organized to act as a distributer of commercial motor bodies. It will represent nearly 100 companies, according to its present plan, and will issue a catalog showing 400 different types. Under the present plan, each manufacturer sends his own catalog to the dealer with his own assortment of styles. This new corporation plans to include all styles in its catalog so that a dealer's customer may have a choice of everything made in the entire trade. The catalog will be issued about Jan. 1. The bodies range all the way from small delivery types up to heavy dumping bodies. Warehouses are to be operated in Chicago, Detroit, New York and other centers. The offices of the company are at 50 East Forty-second Street. The officers are: President, P. H. Patriarche; vice-president, Charles M. Eaton of Raymond Pynchon & Co., bankers; treasurer, Paul D. Langdon, H. L. Horton & Co.; secretary, F. Gates Porter, Pynchon & Co.; directors are the officers and W. A. Harriman, vice-president, Union Pacific; T. W. Cole, president, Cole Paper Co.; J. K. Robinson, Jr., president, Ox Fibre Brush Co.; Frederick A. Wagner, of the law firm of Parker, Davis & Wagner, New York.

New Companies Formed

Latest additions to ranks of Automotive Industries

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MUSKEGON, MICH., Oct 23—The Advance Brass Mfg. Co. has incorporated for $25,000, half of which is to be paid in immediately. It will be located in the building formerly owned by the Racine Boat Mfg. Co. Oscar Berg, Wallace Foote and Felix St. Louis are incorporators. Alex G. Wilson of Chicago is to be general manager.

J. G. Erd Heads Chief Motor Co. of Toronto

TORONTO, ONT., Oct. 29—The Chief Motor Co., Ltd., has orders on hand amounting to $2,000,000 and is planning to construct a new plant and increase its capital in the near future. J. G. Erd and Harry S. Erd of the Erd Motor Co., Saginaw, Mich., are now operating heads and the company will manufacture truck, tractor, and marine motors.

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MUSKEGON, MICH., Oct. 25—The Mat Co. has incorporated for $10,000 and will manufacture cocoa fiber products, including running board and tonneau mats.

W. E. Bassett is president; Walter Krebs, vice-president, and Oscar Berg, secretary and treasurer.

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ALBANY, Oct. 31—The Standard Air Craft Corporation of New York City has been chartered with a capital of $5,000,000. The directors are: Harry B. Mingle of West Orange, Daniel L. Meenan of Plainfield, N. J., and Daniel L. Meenan, Jr., of New York City.

Business Conditions Quiet

(*Continued from page* 776)

the one that to-day is suffering. However, in all quarters much doubt is expressed as to the availability of obtaining material in the future.

It is stated that the iron and steel trade have been requested to furnish complete data to the federal trade committee as to their contracts and obligations during the next 9 months, and fear is expressed that present standing contracts may be abrogated. As the tonnage is limited, it is possible that this, because of the large amounts of iron and steel necessary for war contracts, will cause a general shortage of material in the automobile field.

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Dealers in Eastern States Report Slowing Up in Sales

NEW YORK, Oct. 29—A condition of unrest flanked by the second Liberty Loan on the one hand and the rising costs of necessaries on the other is pervading New England and Eastern New York. Dealers in the larger cities handling the higher-priced cars report a slowing up in sales with but few exceptions, though dealers in lower-priced cars do not appear to have been so greatly affected.

The used car market in New York has experienced a decided slump during the week gone by and nearly every dealer reports rather larger stocks than can comfortably be handled, with little demand.

Among dealers in new cars, one man selling cars in the $3,000 class reports that August was the biggest month he has had yet, that September was not quite as good as September, 1916, but that October will be his record month. Another, in a still higher class, reports sales falling off. One says that sales slowed for 10 days or two weeks but that for the last few days they have been good.

The falling off has been due in a measure to freight congestion—one man says—quite as much as to any other cause. Buick is shipping cars from Detroit to Buffalo by boat and then driving them over the roads, as many as twenty to forty being brought down at a time. Other dealers are getting a few cars, though many of them are making plans to drive very soon.

The accessory situation is not all that can be desired. Both freight and express shipments are months getting in and several dealers report it impossible to get products which come in tin cans, due probably to the shortage of tin. On Long Island, particularly near the army cantonments, accessory dealers are doing a splendid business. In general, though, garages and shops are suffering for mechanics. There does not appear to be any shortage of unskilled labor, though the munition plants have taken their toll of skilled men.

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Chicago Exceeds $500,000 Mark

CHICAGO, Oct. 30—The Chicago Automobile Trade Assn.'s membership responded to the extent of 100 per cent in the association's campaign for the sale of Liberty Loan bonds, subscribing a total of $969,350. One hundred and twelve members reported 100 per cent sales among their employees, and none of the members less than 20 per cent. The greatest subscription coming from one member is that of the Warner Lens Co., which turned in $71,100. The Packard Motor Car Co. is second with $66,600, the Stromberg Motor Devices Co. third with $43,600 and the Harry Newman Stratton Co. with $36,550 fourth, Beckley-Ralston fifth with $25,000 and the Cadillac Automobile Co. sixth with $23,650.

The association got out a daily list showing a thermometer in which the subscription increase was indicated by the creeping of a red line toward the top of the thermometer. The goal set at the beginning was $500,000, but this was exceeded by almost 100 per cent of the total of over $969,000; $8,300 in subscriptions were received through the Chicago Garage Owners' Assn.

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$12,447,050 Subscribed by N. Y. Automobile and Allied Trades

NEW YORK, Oct. 29—Last week's Liberty Loan drive by the automobile and allied trades in this city resulted in raising over $12,000,000. The dealers and several of the big manufacturers raised $5,000,000. This added to the $4,000,000 subscribed by General Motors, Chevrolet and United Motors; the $2,000,000 taken by the Packard company and the $1,447,050 by General Electric brought the total up to $12,447,050. A final count on the Liberty Loan work of the automobile field has not yet been made and it is expected that the total will eclipse these figures.

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Cadillac Holding Dealers' Convention

DETROIT, Oct. 26—No successor has been appointed to K. P. Drysdale, advertising manager of the Cadillac Motor Car Co., who has resigned. At present the work is being subdivided between the members of the advertising department. A dealers' convention is being held this week at the factory for the purpose of discussing sales problems throughout the country.

Bull to Concentrate on Controllite—Out of Hudson

NEW YORK, Oct. 27—E. C. Bull, who has been president of the Super-Lighting Co., New York, manufacturer of the Controllite lens, since the formation of the company, has resigned his position as general sales manager for the Hudson Motor Car Co. of New York to devote all his time to the Super-Lighting Co. At the same time, M. A. Herbert, up to the present Bull's assistant at the Hudson company, becomes treasurer of the Controllite company, and W. E. Johnes becomes secretary. It is planned to increase production and enter upon a campaign of national advertising.

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J. D. Rockap has become president of the Armored Car Co., Philadelphia. He was formerly sales engineer of the King Motor Car Co.

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J. P. Winterson, formerly zone manager for the Southwestern territory for the Chalmers Motor Co., has joined the staff of the Elgin Motor Car Corp. and will act as Pacific Coast representative.

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Glenn A. Sanford is sales engineer of the Perlman Rim Corp., Jackson, Mich., having been promoted from purchasing agent. He will assume his new duties Nov. 1. Charles C. Lewis, formerly with the Ford Motor Co., the Maxwell Motor Co. and Mutual Motors Co., will take the position left vacant by Sanford.

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George W. Smith, Jr., is now connected with the aviation department of the United States, having resigned as assistant consulting engineer of the White Co. He will be located in Philadelphia.

Men of the Industry

Changes in Personnel and Position

J. E. Clifford has been made manager of the wholesale department of the H. Barcroft White Corp., Syracuse, Nash and Chevrolet distributer.

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E. V. Tower is chief engineer of the Hession Tiller & Tractor Corp., Detroit. Tower was formerly head of the experimental department of the Maxwell Motor Co. and has also been connected with the production of the Harroun Motors Corp.

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F. S. Macourck has resigned as purchasing agent of the Peerless Motor Car Co., Cleveland, and is succeeded by R. G. Scott. Macourck is entering business for himself. Scott was at one time with the Packard Motor Car Co. and before that with the E. R. Thomas Co., Buffalo.

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A. E. DeClercq has resigned as metallurgical engineer for the Chalmers Motor Co. to join the Wright-Martin Airplane Co., New Brunswick, N. J., in a similar capacity.

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W. T. Cullen, formerly in the publicity department of the Chalmers Motor Co., is to open a garage and accessory store in Miami, Fla. F. P. Dulmage is a partner in the new concern, the main business of which is to rent cars to tourists.

Crawford Succeeds Gunn as Premier Chief Engineer

INDIANAPOLIS, IND., Oct. 26—C. S. Crawford has succeeded E. G. Gunn as chief engineer and assistant general manager of the Premier Motor Corp. Gunn is now in Washington connected with the truck design division.

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Frank Briscoe, formerly of the Briscoe Mfg. Co., is captain in the Signal Corps, Aircraft Division, of the United States Army, and is at present in Washington.

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H. A. Oswald has been appointed manager of the body division of the Elgin Motor Car Corp., with headquarters at Chicago. He has been in the automobile field for 16 years, being associated with the Hudson, Studebaker and Wadsworth companies until 10 weeks ago, when he joined the Meridian Mfg. Co., Indianapolis, to operate the plant as general manager for the trustee in bankruptcy and to complete the contracts of 1900 bodies for the Elgin company and 900 for the Allen Motor Co., Fostoria, Ohio.

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Fred Crowe of Chicago, and Peter Smith, Eau Claire, have joined the Landover Truck Co., Menominee, Mich., as traveling representatives.

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Willard S. Frency, formerly of the C. S. Von Poettgen Advertising Agency, has been appointed director of sales of the Monarch Governor Co., Detroit, manufacturer of the Monarch governor.

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M. W. Stutzman is district manager in West Virginia and eastern Kentucky for the Commerce Motor Car Co., Detroit. He was formerly with the Smith Motor Truck Corp., Chicago.

New York Out of Sales Congress

NEW YORK, Oct. 26—The Salesmanship Club of New York to-night voted to withdraw from the World's Salesmanship Congress, which was formed 2 years ago and which has held two annual meetings in Detroit. The New York club's resolution was to the effect that the Congress is of no benefit to the club and that the withdrawal is until such time as the Congress does become of benefit.

The club has experienced difficulties with the management of the Congress, maintaining that the Detroit headquarters of the movement has been dictatorial and not co-operative. The club proposes to go ahead with its work, being well financed, and to carry through a good winter's program.

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Henderson Motorcycle in New Plant

DETROIT, Oct. 30—The Henderson Motorcycle Co. is now in its new plant at Bellevue and Mack Avenues, and is starting production on the new 1918 models. The new plant has three stories, and approximately three times the floor space of the former plant. It is planned to double the output during the coming year, and, eventually, to triple it. In spite of the fact that no war orders have been booked, the motorcycle business is good, and the company is behind in its orders.

No radical changes have been made in the new model, and those made have been only in the nature of refinements. The front forks have been made fully 100 per cent stronger, having a triple crown, and oval section fork sides that are 50 per cent wider than those formerly used. The axles likewise have been made larger, with larger ball cups, and the gasoline and oil tanks are now pressed steel with rounded corners.

The price of the regular model has been increased from $325 to $335, and the price of the electrically equipped model is now $385 instead of $350.

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Packard Service Contest Brings Results

DETROIT, Oct. 30—The Packard Motor Car Co. is conducting a technical service contest in all of its various branches and reports of the past week indicate that in nearly every case the service men are showing an active interest in bettering their service.

Milwaukee, Philadelphia, New York, Detroit and Boston are holding mass-meetings in their own service organizations, offering prizes to individuals who offer the best and second best suggestions for quick improvements or plans for getting better results from investments in various divisions of service work.

No greater sectional advancement has been reported than that under San Francisco and Los Angeles, including Sacramento, Bakersfield, Pasadena and Fresno. From these points came reports of more shop space added, general equipment increased and other improvements.

It is estimated that fully 90 per cent of Packard dealers and service station managers have already responded to the efficiency call.

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Kawneer Sash Will Build Airplanes

NILES, MICH., Oct. 29—The Kawneer Sash Co. plans to start airplane manufacture about Jan. 1. At present several large contracts for steel sash are being rushed to completion in order to clear the factory for the work on airplanes. It is expected that a plane of the one-man type will be manufactured and enlargement of the plant together with a temporary stoppage of the steel sash manufacture is possible.

New Factory for Leonard Tractor—To Make All Parts

KALAMAZOO, MICH., Oct. 23—The Leonard Tractor Co. is making plans for a new factory, the first building of which will be 150 by 350 ft., and will start construction as soon as the plans are completed. All parts with the exception of the engines and radiators will be manufactured in the plant, and it is expected that within twelve or fifteen months these also will be manufactured. At present the company is looking for temporary quarters and orders have been placed for tools and equipment.

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Duplex Truck to Use Charlotte Plant

LANSING, MICH., Oct. 23—Due to the consistently increasing production, the Duplex Truck Co. will doubtless maintain the Charlotte, Mich., factory as a branch. This factory will be equipped for production as an aid to the Lansing factory which is now in the process of construction. Last year the old Duplex company built only sixty trucks but since reorganization under Lansing capital, the output has increased to seventy-five per month. The main building of the new factory in construction at Lansing is 72 by 402 ft., the main wing being 72 by 306 ft., and it is expected it will be in operation by Jan. 1.

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Kessler Airplane Engine in Production

DETROIT, Oct. 27—The Kessler Motor Co., which was formed in May for the purpose of manufacturing a 6-cylinder airplane engine, now has several engines through production and is conducting a series of tests at its plant on Vanilla Avenue. This engine incorporates several new features, having four valves per cylinder and utilizing the compression in the crankcase to supply an additional amount of air at the completion of the intake stroke.

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Lincoln Motor Places Contracts

DETROIT, Oct. 27—The Lincoln Motor Co. has placed contracts for the erection of a four-story brick and reinforced concrete factory, 308 by 68 by 56 ft. and 68 by 900 by 56 ft., costing $450,000, and a one-story brick power-house to be built at Warren and Livernois Streets.

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To Make One-Piece Piston Ring

DETROIT, Oct. 27—The Standard Piston Ring Co., at 304 East Larned Street, is making preparations to manufacture a one-piece compression proof ring. Contracts have been secured calling for practically the complete output.

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Leavitt Takes on Oldsmobile

SAN FRANCISCO, Oct. 27—J. W. Leavitt & Co., one of the oldest dealers in the country and a pioneer in the development of the automobile trade on the Pacific Coast, has just taken over the distribution of the Oldsmobile for the entire states of California and Nevada. He also handles the Chevrolet.

Current News of Factories

Notes of New Plants—Old Ones Enlarged

Delco Salesmen Convene

DAYTON, Oct. 27—Delco-Light dealers and salesmen from Eastern and Central divisions are holding a convention here this week. The best methods of working their territory and of supplying their customers with service were discussed and a service school was part of the convention.

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Federal Rubber District Managers Meet

MILWAUKEE, WIS., Oct. 27.—Sixty-five district managers and district representatives of the Federal Rubber Co. gathered at the main works and offices in Cudahy, suburb of Milwaukee, for a three-day convention on October 23, 24 and 25, and talked over plans for making 1918 the biggest year in the existence of the business. The visitors were able to see four large factory additions, a new office addition, and a large power plant addition in course of completion. Among the speakers during the convention were: B. H. Pratt, general manager; Herbert A. Githens, general sales manager; J. M. Tait, assistant treaturer; Arthur A. Frank, factory superintendent; G. H. Hamilton, assistant sales manager, and A. J. Zealley, advertising manager.

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Will Make Mud Hooks

STURGEON BAY, WIS., Oct. 29—Harry Hocks, Sturgeon Bay, Wis, and Otto Nelson, West Allis, Wis., are planning to establish a plant for the manufacture of a new type of mud-hook for cars and trucks which they have recently perfected.

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New Machinery for LaCrosse Tractor

LACROSSE, WIS., Oct. 29—The LaCrosse Tractor Co. has decided to purchase new machinery and equipment costing about $75,000 for immediate installation in order to execute orders on hand on schedule time. The new machinery will enable the company to increase its output from 75 to 100 per cent. An addition to the plant will be erected early in 1918.

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Standard Steel to Build

MILWAUKEE, WIS., Oct. 29—The Standard Steel Corp., Milwaukee, which was organized about eight years ago, with $60,000 capital stock, to manufacture gas engines, tractors, barn equipment, etc., has increased its capital to $300,000 and will begin work at once on the erection of a plant at Lake Street and Hopkins Road, near the parts and frame plant of the A. O. Smith Corp., Milwaukee. The main shop will contain 250,000 sq. ft. of floor space.

Holt to Double Plant—Will Cost $1,000,000

PEORIA, Oct. 30.—The Holt Manufacturing Co., Peoria, will shortly double the size of its plant. At a meeting of the board of directors this week contracts were let for new buildings and machinery aggregating $1,000,000. Recently the company acquired a tract of 35 acres adjoining its plant, while a public street was vacated to add to the space required. The new structures will include a machine shop with 75,000 sq. ft., an assembly shop, foundries and a Government warehouse. The enlarged plant will necessitate the increase of the force of employees to 3,000 men, most of them skilled mechanics. A new feature of the plant is the army training camp. Quarters have been opened for 100 officers and barracks for 500 men. All will be trained in the construction, operation and repair of the peculiar type of tractor required for the service of the army abroad.

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Packard Aviation Plant Costs $50,000

DETROIT, Oct. 29—The Packard Motor Car Co. has placed a contract to build a one-story frame aviation plant 62 by 240 by 12 ft. on the corner of Mt. Elliott and Lynch Road. The cost is to be $50,000, and the buildings will be used for the construction of airplane engines.

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Standard Screw Buys Former P. R. Manufacturing Plant

DETROIT, Oct. 29—The Standard Screw Co. has purchased the former plant of the P. R. Mfg. Co., consisting of two large two-story brick buildings at 621-659 Bellevue Avenue. These are 417 ft. long by 164 ft. deep, and after a few additions have been made will afford over 100,000 sq. ft. of floor space.

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75 United Motors Trucks Daily

GRAND RAPIDS, MICH., Oct. 24—The United Motors Co. has developed its output in the last 5 months and is materially increasing this output each month. The present output is about seventy-five trucks monthly. Increases have also been made in the sales organization and the territory has been extended throughout the country. About twelve roadmen are now employed.

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Columbia Truck to Double Production

PONTIAC, MICH., Oct. 29—The Columbia Truck Co. has secured an order amounting to $975,000 from a foreign source. A period of 2 years will be required for its completion and the order calls for a truck of the 2-ton type. It is planned to double the present production of 500 trucks per year during the next year and a factory addition 370 by 90 ft. is at present being laid out. In addition to the 2-ton truck the company also manufactures a 6-ton semi-trailer and a 4-ton reversible 4-wheel trailer.

Haynes Factory Branch in Detroit

CHICAGO, Oct. 29—The Haynes Motor Car Co., Kokomo, Ind., is opening a factory branch at Detroit, with C. L. Watson, formerly assistant general manager at Kokomo, in charge. Heretofore the Loveland company has represented Haynes in Detroit.

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C. F. Mitchell Buys Land

COLLINWOOD, OHIO, Oct. 29—The C. F. Mitchell & Son Co. has purchased 11¾ acres of land on the Nickel Plate Railroad at London and Wayside roads and plans the erection of a six-unit fireproof automobile factory. The purchase price was $52,000, and it is expected that the factory buildings will cost approximately $100,000.

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U. S. Truck Conducting Sales Contest

CINCINNATI, OHIO, Oct. 29 — The United States Motor Truck Co. is conducting a sales contest for the purpose of securing information to be used in sales promotion. It includes the distributers as well as the individual salesmen and is national in its scope.

The salesmen have been divided into three classes: first, those salesmen working for distributers; second, the distributers themselves, and third, the district representatives of the company. Each week for a period of 10 weeks the contestants will receive ten different questions and will be asked to seek the answers and send them to the contest board.

All questions in each set must be answered before the next set is sent out to any individual, and the correct answers are sent out within 2 weeks of issue. The questions asked require considerable investigation and will tend to make the salesmen think in an intelligent manner. Not only are the technical points of the truck, together with its operation, covered, but also the questions entering into the various phases of salesmanship in the various classes of business. Replies to date have been very carefully answered and the company expects to obtain much valuable data. Prizes will be awarded to the winners in each group.

Licenses for Life of Enemy Patents

(*Continued from page* 776)

these regulations for the use of such patents it must be shown that such licensing will be for the public welfare, that there is a demand for the article not now being supplied, and that the applicant is equipped to manufacture it. A semi-annual report of business done will have to be filed by the licensee with the Federal Trade Commission.

The use of trade-marks, copyrighted labels, or similar trade devices will be granted in exceptional circumstances in connection with the use of the patent.

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Bearings Company Opens N. Y. Office

NEW YORK, Oct. 30—The Bearings Company of Pennsylvania, maker of bearings and the Gill piston ring, has opened a branch office in New York at 1864 Broadway. A complete stock of bearings is maintained. A sales agency has also been installed at 293 Halsey Street, Newark, N. J.

Calendar

ASSOCIATIONS

1918

Jan. 3-4—New York Automotive Electric Assn. meeting.

SHOWS

Nov. 12-17—Los Angeles, Cal., Motor Car Dealers' Assn., Billy Sunday Tabernacle.

Nov. 12-18—Denver, Col., Automobile Trade Assn., Show Committee, Auditorium. G. A. Wahlgreen, Mgr.

Dec. 3-8—Akron, O., Akron Auto Show Assn., Auditorium Armory. O. G. Armstrong, Mgr.

1918

January — Kalamazoo, Mich., Kalamazoo Automobile Dealers' Assn., Armory.

Jan. 2-9—New York, Salon. Automobile Salon, Inc., Astor Ballroom. John R. Eustis, Mgr.

Jan. 5-12—New York Show, Grand Central Palace, National Automobile Chamber of Commerce.

Jan. 11-19 — Philadelphia, 17th Annual Show, Philadelphia Auto Trade Assn., Commercial Museum Bldg.

Jan. 11-19—Providence, R. I., R. I. Licensed Auto. Dealers' Assn., State Armory. Percival S. Clark, Mgr.

Jan. 19-26 — New York Motor Boat Show, Grand Central Palace, National Assn. of Engine and Boat Manufacturers.

Jan. 19-27 — Cleveland, Seventeenth Annual, Cleveland Automobile Show Co., Wigmore Coliseum. Fred. H. Caley, Mgr.

Jan. 19-28—Montreal, Can., Montreal Automobile Trade Assn., Ltd., Almy Bldg. T. C. Kirby, Mgr.

Jan. 21-26—Manchester, N. H., Academy. Couture Bros.

Jan. 21-26—Scranton, Pa., Scranton Motor Trades Assn., Armory. Hugh B. Andrews, Mgr.

Jan. 23-28—Allentown, Pa., Lehigh Auto. Trade Assn., Traylor Motor Co.'s Garage. P. W. Leisering, Publicity Mgr.

Jan. 26-Feb. 2—Chicago National Show, Coliseum and Armory, National Automobile Chamber of Commerce.

Jan. 26-Feb. 2—Chicago, Salon. Elizabeth Room of Congress Hotel.

Jan. 26-Feb.2—Harrisburg, Pa., Capital City Motor Dealers' Assn. J. Clyde Myton, Mgr.

February — Peoria, Ill., Peoria Auto and Accessories Dealers' Assn. W. O. Ireland, Mgr.

Feb. 11-16—St. Louis, Mo., St Louis Auto Mfrs. & Dealers Assn., Robert E. Lee, Mgr.

Feb. 11-16—Kansas City, Mo., Third Annual National Tractor Show.

Feb. 16-23—New York, Second Pan-American Aeronautic Exposition, Grand Central Palace and Madison Square Garden.

Feb. 18-23—Grand Rapids, Mich., Automobile Business Assn., Klingman Building. Ernest T. Conlon, Mgr.

Feb. 18-23—Newark, N. J., N. J. Auto Exhibition, Co. G. First Regiment Armory. Claude E. Holgate, Mgr.

Feb. 18-23—Des Moines, Ia., Des Moines Automobile Dealers' Assn., Coliseum. C. G. Van Vliet & Dean Schooler, Mgrs.

Feb. 18-23 — Springfield, Ohio. Springfield Auto Trades Assn., Memorial Hall. C. S. Burke, Mgr.

Feb. 18-23—Waterbury, Conn., United Shows Co.

Feb. 16-24—San Francisco, Cal., San Francisco Dealers' Assn., Exposition Auditorium. G. A. Wahlgreen, Mgr.

Feb. 18-25 — Pittsfield, Mass. State Guard, State Armory, James J. Callaghan Mgr.

Feb. 18-27—So. Bethlehem, Pa. Fourth Annual (cars 18-23; trucks 25-27), Coliseum. J. L. Elliott, Mgr.

Feb. 22-March. 9—Brooklyn, N. Y., Brooklyn Motor Vehicle Dealers' Assn., Twenty-third Regiment Armory. I. C. Kirkham, Treas.

March — San Francisco, Cal. Motor Truck Dealers of San Francisco, Auditorium. Ivan R. Gates.

Mar. 19-24—Cedar Rapids, Ia., Cedar Rapids Auto Trade Assn., Auditorium.

Apr. 9-13—Stockton, Cal., San Joaquin Auto Trade Assn. Samuel S. Cohn, Mgr.

Sept. 23-28 — Chicago, National Accessory Show for Fords, Coliseum.

Engineering

American Railway Master Mechanics' Assn.
American Institute of Electrical Engineers.
Master Builders' Assn.
American Society of Heating and Ventilating Engineers.
Association Iron and Steel Electrical Engineers.
Mining and Metallurgical Society of America.
Society of Automotive Engineers.
Illuminating Engineering Society.
National Electric Light Assn.
National Gas Engine Assn.
American Society for Testing Materials.
American Institute of Metals.
American Foundrymen's Assn.
Society Naval Architecture and Marine Engineers.

NOVEMBER

3—Assn. Iron & Steel Elec. Engrs. monthly meeting Phila. section.

8—Amer. Soc. Heat. & Vent. Engrs. monthly meeting Penn. section at Phila.

9—Amer. Soc. Heat. & Vent. Engrs. monthly meeting Ohio Section at Cleveland.

10—Assn. Iron & Steel Elec. Engrs. monthly meeting Cleveland section.

12—Amer. Soc. Heat. & Vent. Engrs. monthly meeting Ill. Section at Chicago.

12—Amer. Soc. Heat. & Vent. Engrs. monthly meeting Mich. section at Detroit.

13—Amer. Soc. Heat. & Vent. Engrs. monthly meeting Mass. section at Boston.

15—Mining & Met. Soc. Amer. section at Engrs. Club.

15-16—Soc. Naval Arch. & Marine Engrs. annual meeting.

17—Assn. Iron & Steel Elec. Engrs. monthly meeting Pittsburgh section.

19—Amer. Soc. Heat. & Vent. Engrs. monthly meeting New York section.

DECEMBER

1—Assn. Iron & Steel Elec. Engrs. monthly meeting Phila. section.

8—Assn. Iron & Steel Elec. Engrs. monthly meeting Cleveland section.

10—Amer. Soc. Heat. & Vent. Engrs. monthly meeting Ill. section at Chicago.

11—Amer. Soc. Heat. & Vent. Engrs. monthly meeting Mich. section at Detroit.

13—Amer. Soc. Heat. & Vent. Engrs. monthly meeting Penn. section at Phila.

13—Amer. Soc. Heat. & Vent. Engrs. monthly meeting Ohio section at Cleveland.

15—Assn. Iron & Steel Elec. Engrs. monthly meeting Pittsburgh section.

17—Amer. Soc. Heat. & Vent. Engrs. monthly meeting New York section.

20—Mining & Met. Soc. Amer. Monthly meeting New York section at Engrs. Club.

A Directory of Motor Truck Makers

210 Manufacturers of Commercial Vehicles for 1918—188 Gasoline—Two Steam and Nine Electric—Models Made in Tons Capacity

Gasoline Vehicles

Name	Manufacturer	Address	MODELS IN TONS CAPACITY (Figures refer to capacity, not number of models)														
			Under ½	½	¾	1	1½	2	2½	3	3½	4	5	5½	6	6½	7 and over
A. & B.	American & British Mfg. Co.	Providence, R. I.								3			5				
Acason	Acason Motor Truck Co.	Detroit, Mich.					1½	2			3½		5				T
Acme	Cadillac Auto Truck Co.	Cadillac, Mich.				1		2			3½						
Allis-Chalmers	Allis-Chalmers Mfg. Co.	Milwaukee, Wis.											5				
American	American Motor Truck Co.	Detroit, Mich.									3½						
Armleder	O. Armleder	Cincinnati, Ohio						2			3½						
Atlas	Martin Truck & Body Corp.	York, Pa.			¾												
Atterbury	Atterbury Motor Car Co.	Buffalo, N. Y.					1½	2			3½						
Autocar	Autocar Co.	Ardmore, Pa.						2									
Available	Available Truck Co.	Chicago, Ill.				1		2			3½		5				
Avery	Avery Co.	Peoria, Ill.				1		2		3			5				
Barber	Barber Motors Corp.	Brooklyn, N. Y.															T
Barker	C. L. Barker	Norwalk, Conn.				1		2									
Bauer	Bauer Machine Wks Co.	Kansas City, Mo.		½	¾												
Beck	Beck Motor Truck Works	Cedar Rapids, Iowa				1	1½	2									
Beech Creek	Beech Creek Truck & Auto Co.	Beech Creek, Pa.								3							
Bell	Bell Motor Car Co.	York, Pa.		¾													
Bessemer	Bessemer Motor Truck Co.	Grove City, Pa.				1		2			3½						
Bethlehem	Bethlehem Motors Corp.	Allentown, Pa.					1½		2½								
Blair	Blair Motor Truck Co.	Newark, Ohio						2		3			5				
Bourne	Bourne Magnetic Truck Co.	Philadelphia, Pa.						2			3½						
Brinton	Brinton Motor Truck Co.	Philadelphia, Pa.				1			2½								
Briscoe	Briscoe Motor Co.	Jackson, Mich.		½		1											
Brockway	Brockway Motor Truck Co.	Cortland, N. Y.					1½	2			3½						
Buick	Buick Motor Co.	Flint, Mich.			¾												
Burford	Taylor Motor Truck Co.	Fremont, Ohio						2			3½						
Chase	Chase Motor Truck Co.	Syracuse, N. Y.				1	1½		2½	3	3½						
Clydesdale	Clyde Cars Co	Clyde, Ohio			¾		1½	2			3½		5				
Collier	Collier Motor Truck Co.	Sandusky, Ohio			¾												
Columbia	Columbia Motor Truck & Trailer Co.	Pontiac, Mich.				1		2									
Commerce	Commerce Motor Car Co.	Detroit, Mich.			¾	1											
Concord	Abbott-Downing Co.	Concord, N. H.				1		2									
Continental	Continental Motor Truck Co.	Chicago, Ill.				1	1½	2			3½						
Corbitt	Corbitt Motor Truck Co.	Henderson, N. C.				1	1½	2	2½		3½		5				
Corliss	Corliss Motor Truck Co.	Corliss, Wis.		½													
Couple-Gear	Couple-Gear Freight Wheel Co.	Grand Rapids, Mich.									3½		5				
Croce	Croce Automobile Co.	Asbury Park, N. J.		½													
Dain	Dain Mfg. Co.	Ottumwa, Iowa				1											
Dart	Dart Motor Truck Co.	Waterloo, Iowa				1		2			3½						
Dayton	Durable Dayton Truck Co.	Dayton, Ohio						2			3½		5				7½
D-E	Day-Elder Motors Co.	Newark, N. J.			¾	1	1½		2½								
DeKalb	DeKalb Wagon Wks. Co.	DeKalb, Ill.						2	2½								
Denby	Denby Motor Truck Co.	Detroit, Mich.				1	1½	2	2½								
Denmo	Grant Motor Car Corp.	Cleveland, Ohio.		½			1½										
Diamond-T	Diamond-T Motor Car Co.	Chicago, Ill.				1	1½	2			3½		5				
Dispatch	Dispatch Motor Car Co.	Minneapolis, Minn.			¾												
Doane	Doane Motor Truck Co.	San Francisco, Cal.							2½						6		
Dorris	Dorris Motor Car Co.	St. Louis, Mo.			¾			2									
Duplex	Duplex Truck Co.	Lansing, Mich.						2		3							
Durable	Durable Motor Truck Co.	Hammond, Ind.															
Ellsworth	Mills-Ellsworth Co.	Keokuk, Iowa		½													
Fageol	Fageol Motors Co.	Oakland, Cal.						2									
Fargo	Fargo Motor Car Co.	Chicago, Ill.						2									
Federal	Federal Motor Truck Co.	Detroit, Mich.				1	1½	2			3½		5				
Forschler	Forschler Wagon Co.	New Orleans, La.			¾	1	1½	2									
Ford	Ford Motor Co.	Detroit, Mich.				1											
F. W. D.	Four Wheel Drive Auto Co.	Clintonville, Wis.								3							
Fulton	Fulton Motor Truck Co.	Farmingdale, L. I.					1½										
Gabriel	Gabriel Auto Co.	Cleveland, Ohio.				1		2			3½						
Garford	Garford Motor Truck Co.	Lima, Ohio				1	1½	2			3½		5		6		
Gary	Gary Motor Truck Co.	Gary, Ind.				1	1½	2	2½		3½						
G. A. Schacht	G. A. Schacht Motor Truck Co.	Cincinnati, Ohio						2	2½		3½		5				
Gem	Gem Motor Car Corp.	Grand Rapids, Mich.		½													
Geneva	Geneva Wagon Co.	Geneva, N. Y.			¾												
G rsix	Gerlinger Motor Car Co.	Portland, Ore.						2½									
Globe	Globe Motor Truck Co.	E. St. Louis, Ill.				1											
G. M. C.	General Motors Truck Co.	Pontiac, Mich.			¾	1	1½	2			3½		5				
Gramm-Bernstein	Gramm-Bernstein Co.	Lima, Ohio				1	1½	2	2½		3½		5				
G. V.-Mercedes	General Vehicle Co.	Long Island City, N. Y.													6		
Hahn	Hahn Motor Truck Co.	Hamburg, Pa.				1		2									
Hall	Lewis-Hall Iron Wks.	Detroit, Mich.						2			3½		5				
Harrison	Robert Harrison Co.	South Boston, Mass.									3½						
Harvey	Harvey Motor Truck Co.	Harvey, Ill.							2½		3½		5				7
Hawkeye	Hawkeye Mfg. & Repair Co.	Sioux City, Iowa					1½										
Hendrickson	Hendrickson Motor Truck Co.	Chicago, Ill.						2			3½						

Heavy type represents vehicles whose specifications are given in this issue.

A Directory of 210 Manufacturers of Gasoline, Steam,

Name	Manufacturer	Address	MODELS IN TONS CAPACITY *Figures refer to capacity, not number of models*													
			Under ½	½	¾	1	1½	2	2½	3	3½	4	5	5½	6	6½	7 and over
Hewitt-Ludlow	Hewitt-Ludlow Auto Co.	San Francisco, Cal.															
Highway	Highway Tractor Co.	Indianapolis, Ind.									3½						
Higrade	Higrade Motors Co.	Grand Rapids, Mich.			¾	1											
Hoover	Hoover Wagon Co.	York, Pa.			¾												
Horner	Detroit-Wyandotte Motor Co.	Wyandotte, Mich.					1½	2		3			5				
Hurlburt	Hurlburt Motor Truck Co.	New York City					1½	2			3½		5				7
I. H. C.	International Harvester Corp.	Akron, Ohio			¾	1		2									
Independent	Independent Motors Corp.	Port Huron, Mich.				1		2									
Indiana	Indiana Truck Co.	Marion, Ind.				1		2			3½		5				
Kearns	Kearns Motor Car Co.	Beavertown, Pa.		½													
Kelly-Springfield	Kelly-Springfield Motor Truck Co.	Springfield, Ohio.					1½		2½		3½	4	5		6		
Kimball	Kimball Motor Truck Co.	Los Angeles, Cal.															
King	A. R. King Mfg. Co.	Kingston, N. Y.									3½						
Kissel	Kissel Motor Car Co.	Hartford, Wis.			¾	1½		2			3½						
Kleiber	Kleiber Co., Inc.	San Francisco, Cal.				1	1½	2	2½		3½		5				
Knox	Knox Motors Co.	Springfield, Mass.								3							T
Koehler	H. J. Koehler Motors Corp.	Newark, N. J.					1½			3							
Lambert	Buckeye Mfg. Co.	Anderson, Ind.				1											
Landshaft	William Landshaft & Son	Chicago, Ill.				1		2									
Lane	Lane Motor Truck Co.	Kalamazoo, Mich.					1½		2½		3½						
Lange	Lange Motor Truck Co.	Pittsburgh, Pa.					1½		2½								
Lapeer	Lapeer Tractor-Truck Co.	Lapeer, Mich.								3			5				
Larrabee	Larrabee-Deyo Motor Truck Co.	Binghamton, N. Y.				1	1½		2½		3½						
Lawson	Lawson Mfg. Co.	Pittsburg, Pa.		½													
Lenox	Lenox Motor Car Co.	Boston, Mass.															
Lippard-Stewart	Lippard-Stewart Motor Car Co.	Buffalo, N. Y.		½	¾	1	1½	2									
Little Giant	Chicago Pneumatic Tool Co.	Chicago, Ill.			¾	1	1½	2									
Lombard	Lombard Auto-Tractor-Truck Corp.	New York City											5				
Lumb	Lumb Motor Truck & Tractor Co.	Aurora, Ill.							2½								
Maccar	Maccar Co.	Scranton, Pa.					1½		2½		3½			5½			
Mack	International Motor Co.	New York City				1	1½	2			3½		5	5½		7	7&T
Manly	Manly Motor Corp.	Chicago, Ill.					1½	2	2½								
Master	Master Trucks, Inc.	Chicago, Ill.						2									
Maxfer	Maxfer Truck & Tractor Co.	Chicago, Ill.															
Maxwell	Maxwell Motor Co.	Detroit, Mich.				1											
Menominee	Menominee Motor Truck Co.	Menominee, Mich.			¾	1	1½	2			3½						
Mercury-Bulley	Mercury Mfg. Co.	Chicago, Ill.															T
Modern	Bowling Green Motor Car Co.	Bowling Green, Ohio.					1½										
Moreland	Moreland Motor Truck Co.	Los Angeles, Cal.				1	1½		2½			4	5				
Muskegon	Muskegon Engine Co.	Muskegon, Mich.						2									
Nash	Nash Motors Co.	Kenosha, Wis.				1		2									
Nelson & LeMoon	Nelson & LeMoon	Chicago, Ill.					1½	2		3			5				
Netco	New England Truck Co.	Fitchburg, Mass.						2									
New York	Tegetmeier & Reipe	New York City					1½	2									
Niles	Niles Car & Mfg. Co.	Niles, Ohio				1		2									
Noble	Noble Motor Truck Co.	Kendallsville, Ind.						2									
OK	Oklahoma Auto Mfg. Co.	Muskogee, Okla.															
Old Hickory	Kentucky Wagon Mfg. Co.	Louisville, Ky.			¾												
Old Reliable	Old Reliable Motor Truck Co.	Chicago, Ill.					1½	2	2½	3		4	5				7
Oneida	Oneida Motor Truck Co.	Green Bay, Wis.				1	1½	2			3½						
Overland	Willys-Overland Co.	Toledo, Ohio			¾												
Packard	Packard Motor Car Co.	Detroit, Mich.				1		2	2½			4	5		6		7
Packet	Packet Motor Truck Co.	Minneapolis, Minn.	½														
Palmer	Palmer-Meyer Motor Car Co.	St. Louis, Mo.				1		2									
Peerless	Peerless Motor Car Co.	Cleveland, Ohio.						2		3		4	5		6		
Phoenix Centiped	Phoenix Mfg. Co.	Eau Claire, Wis.											5				
Pierce-Arrow	Pierce-Arrow Motor Car Co.	Buffalo, N. Y.						2					5				
Pull-More	Pull-More Motor Truck Co.	Pittsburgh, Pa.								3							
Rainier	Rainier Motor Corp.	New York City		½													
Reo	Reo Motor Car Co.	Lansing, Mich.			¾			2									
Rennoc-Leslie	Rennoc-Leslie Motor Co.	Philadelphia, Pa.								3							
Republic	Republic Motor Truck Co.	Alma, Mich.			¾	1	1½	2			3½		5				
Reya	Reya Co.	Napoleon, Ohio				1											
Riker	Locomobile Co.	Bridgeport, Conn.								3		4					
Robinson	Golden West Motors Co.	Sacramento, Cal.						2									
Royal	Royal Motor Truck Co.	New York City				1			2½		3½		5		6		7
Rowe	Rowe Motor Truck Co.	Downington, Pa.				1		2		3			5				
Rush	Rush Motor Truck Co.	Philadelphia, Pa.		½													
Sandow	Sandow Motor Truck Co.	Chicago, Ill.				1		2									
Sanford	Sanford Motor Truck Co.	Syracuse, N. Y.					1½		2½		3½						
Schleicher	Schleicher Motor Vehicle Co.	New York City								3			5				
Selden	Selden Motor Vehicle Co.	Rochester, N. Y.			¾	1		2	2½		3½		5				
Seneca	Seneca Motor Truck Co.	Fostoria, Ohio															
Service	Service Motor Truck Co.	Wabash, Ind.				1	1½	2			3½		5				
Signal	Signal Motor Truck Co.	Detroit, Mich.					1½	2	2½			4	5				
Standard	Standard Motor Truck Co.	Detroit, Mich.						2			3½		5				
Steele	W. M. Steele	Worcester, Mass.						2		3		4	5				
Stegeman	Stegeman Motor Car Co.	Milwaukee, Wis.						2		3		4	5				7
Sterling	Sterling Motor Truck Co.	Milwaukee, Wis.							2½		3½		5				7
Stewart	Stewart Motor Corp.	Buffalo, N. Y.			¾		1½	2									
Studebaker	Studebaker Corp.	South Bend, Ind.		½		1											
Sullivan	Sullivan Motor Car Co.	Rochester, N. Y.					1½	2									
Superior	Superior Motor Truck Co.	Atlanta, Ga.				1		2									
Taylor	Taylor Motor Truck Co.	Fremont, Ohio				1	1½		2½		3½		5				
Thomas	Consolidated Motors Corp.	Schenectady, N. Y.						2			3½						
Tiffin	Tiffin Wagon Co.	Tiffin, Ohio			¾	1	1½		2½		3½		5		6		
Titan	Millman Motor Truck Co.	Milwaukee, Wis.											5				
Topp-Stewart	Topp-Stewart Tractor Co.	Waukesha, Wis.															
Tower	Tower Motor Truck Co.	Greenville, Mich.						2									
Transport	Transport Tractor Co.	Long Island City, N. Y.											5				
Triangle	Triangle Motor Truck Co.	St. Johns, Mich.					1½										
Turnbull	Turnbull Motor Truck & Wagon Co.	Defiance, Ohio															

Heavy type represents vehicles whose specifications are given in this issue.

Electric and Electric Industrial Vehicles for 1918—Concluded

Name	Manufacturer	Address	MODELS IN TONS CAPACITY *Figures refer to capacity, not number of models*														
			Under ½	½	¾	1	1½	2	2½	3	3½	4	5	5½	6	6½	7 and over
Union	Union Motor Truck Co.	Bay City, Mich							2½								
United	United Motors Co.	Grand Rapids, Mich						2			3½	4	5				
United Four-Wheel Drive	United Four-Wheel Drive Co.	Chicago, Ill								3							
Universal	Universal Service Co	Detroit, Mich					1½	2		3							
U. S.	United States Motor Truck Co.	Cincinnati, Ohio						2			3½		5				
Van Winkle	Van Winkle Motor Truck Co.	Atlanta, Ga															
Velie	Velie Motors Corp.	Moline, Ill									3½						
Vim	Vim Motor Truck Co.	Philadelphia, Pa		½				2									
Voltz	Voltz Bros.	Chicago, Ill								3			5				
Walter	Walter Motor Truck Co.	New York City											5				
Watson	Watson Wagon Co.	Canastota, N. Y.											T				
Ware	Twin City Four Wheel Drive Co.	St. Paul, Minn									3½						
Western	Western Truck Mfg. Co.	Chicago, Ill															7
White	White Co.	Cleveland, Ohio			¾		1½			3			5				
White Hickory	White Hickory Wagon Mfg. Co.	Atlanta, Ga.					1½										
Wichita	Wichita Falls Motor Co.	Wichita Falls, Tex.				1	1½	2	2½		3½		5				
Wilcox	H. L. Wilcox Motor Co.	Minneapolis, Minn.				1	1½	2			3½		5				
Wilson	J. C. Wilson Co.	Detroit, Mich						2			3½						
Winther	Winther Motor Truck Co.	Winthrop Harbor, Ill.						2		3		4	5		6		
Wisconsin	Myers Machine Co.	Sheboygan, Wis					1½		2½								
Witt-Will	Witt-Will Co	Washington, D. C.				1			2½								
W-S	Weier-Smith Truck Co.	Birmingham, Mich							2½								

Steam Vehicles

Doble	Doble Laboratories	San Francisco, Cal				1											
Steamotor	Steamotor Truck Co.	Chicago, Ill						2									

Electric Vehicles

Atlantic	Atlantic Vehicle Co.	Newark, N. J.															
C.T.	Commercial Truck Co.	Philadelphia, Pa		½		1		2			3½		5				
Couple-Gear	Couple-Gear Freight Wheel Co.	Grand Rapids, Mich											5				7
G.V.	General Vehicle Co.	Long Island City, L. I.		½		1		2			3½		5				
Lansden	Lansden Co.	Brooklyn, N. Y.						2					5		6		
Lansing	Lansing Co., Inc.	Lansing, Mich							2½						6		
Urban	Kentucky Wagon Mfg. Co.	Louisville, Ky.															
Walker	Walker Vehicle Co.	Chicago, Ill		½		1		2		3		4	5				T
Ward	Ward Motor Vehicle Co.	Mt. Vernon, N. Y.	½	½		1		2			3½		5				

Electric Industrial Trucks

Automatic	Automatic Transportation Co.	Buffalo, N. Y.						2									
Buda	Buda Co.	Chicago, Ill.															
Electromobile	Orenstein-Arthur Koppel Co.	Koppel, Pa					1½	2									T
Elwell-Parker	Elwell-Parker Electric Co.	Cleveland, Ohio															
G.V.	General Vehicle Co.	Long Island City, N. Y.															
Hoagland-Thayer	Hoagland-Thayer, Inc.	Newark, N. J.															
Hunt	C. W. Hunt Co.	West New Brighton, N. Y.															
Lansden	Lansden Co., Inc.	Brooklyn, N. Y.															
Lansing	Lansing Co., Inc.	Lansing, Mich						2	2½				5				
Mercury	Mercury Mfg. Co.	Chicago, Ill.															
Transmobile	Cowan Electric Co.	Holyoke, Mass.						2									

Heavy type represents vehicles whose specifications are given in this issue.

Buyers' Guide to 1918 Gasoline Trucks

Classified According to Load Capacity and Combined with Salient Features of Chassis

TRUCKS OF UNDER ½-TON CAPACITY

Name and Model	Chassis Price	Wheel-base, Inches	Tires	N.A.C.C. Horse-power	Elec-tric System	Gear-set Type	Final Drive
Briscoe.....24	$725	104	pneu....	16.92	s&l-2....	selec..	bevel.....
Buick.....	790	106	pneu....	18.21	s&l.....	selec..	bevel
Overland.....	635	104	pneu....	18.21	s,l&i-2..	selec..	bevel.....
Packet.....	300	100	pneu....	12.08	none....	fric...	dbl chn

TRUCKS OF ½-TON CAPACITY

Atlas.....18	$885*	106	pneu....	16.92	s,l&i-2...	selec..	sp-bev
Corliss.....A	800*	100	pneu....	15.64	.....	selec..	bevel
Croce.....17	825	108	p&s.....	16.92	.....	selec..	bevel
Ellsworth.....25-A	695	108	pneu....	16.92	s,l&i-2...	prog..	bevel
Gem.....	675	.....	pneu....	22.50	s&l.....	selec..	bevel
Kearns.....D	....	107	pneu....	16.92	s,l&i-2...	selec..	bevel
Lawson.....35	.....	112	pneu....	22.50	s&l.....	selec..	bevel
Lippard-Stewart.....MW	1,025	106	pneu....	16.92	s&l-2....	selec..	top worm
Overland.....83B	800	106	pneu....	27.20	s,l&i-2...	selec..	sp-bev
Rainier.....R-1	895	115	pneu....	16.92	s&l-2....	selec..	top worm
Rush.....D	895	105	pneu....	16.92	s&l.....	selec..	bevel
Studebaker.....	945	112	pneu....	24.22	s,l&i-2...	selec..	bevel
Vim.....21	765	108	pneu....	14.40	lighting..	selec.	bevel

TRUCKS OF ¾-TON CAPACITY

Clydesdale.....25	$1,025	124	pneu....	19.61	.....	selec..	bevel
Collier.....M	900	118	pneu....	16.92	.....	selec..	bevel
D-E.....J	975	108	pneu....	15.64	s&l.....	selec..	top worm
Denmo.....12	960	115	pneu....	16.92	s&l.....	selec..	int-gear
Dispatch.....	1,100	120	pneu....	22.50	s,l&i....	fric...	dbl chn
Forschler.....S	1,100	120	solid....	15.64	s,l&i....	selec..	top worm
Geneva.....	.....	96	solid....	22.18	.....	plan..	dbl chn
G.M.C.....16	1,395	132	pneu....	22.50	opt.....	selec..	bevel
Hahn.....	1,100	120*	solid....	19.61	.....	selec..	top worm
Higrade.....A-17	....	115	pneu....	16.92	s&l-2....	ind-c..	top worm
Hoover.....15-B	1,375	120	pneu....	19.61	none....	selec..	top worm
I.H.C.....H	1,450	115	solid....	19.61	s&l.....	selec..	int-gear
Kisselkar.....	1,185	135	pneu....	24.22	s&l-2*..	selec..	sp-bev
Lippard-Stewart.....W	1,750	125	opt.....	22.50	s&l*....	selec..	top worm
Little Giant.....15	1,500	138	p&s.....	19.61	.....	selec..	top worm
Menominee.....EW	1,425	124	cush....	22.50	.....	selec..	top worm
Modern.....30	1,800	132	solid....	22.50	none....	selec..	top worm
Old Hickory.....M	875	112	pneu....	16.92	s,l&i....	selec..	Sp-bev
Reo.....F	1,050	128	pneu....	27.20	s,l&i-2...	selec..	sp-bev
Republic.....Daptch	895	110	p&s*....	16.92	starting..	selec..	int-gear
Republic.....Spec.	895	128	p&s*....	16.92	.....	selec..	int-gear

TRUCKS OF ¾-TON CAPACITY (Cont'd)

Selden.....G	$1,075	110	pneu....	15.64	s&l-2*..	selec..	top worm
Stewart.....6	845	110	pneu....	15.64	.....	selec..	int-gear
Tiffin.....A	1,190	110	pneu....	19.61	none....	selec..	int-gear
White.....GBBE	2,300	133½	pneu....	22.50	s&l*....	selec..	bevel
Wilcox.....V	1,300	120	pneu....	19.61	none....	selec..	worm

TRUCKS OF 1-TON CAPACITY

Acme.....B	$1,750	130	solid....	22.50	s,l&i-2...	ind-c..	top worm
Available.....1	1,775	132	solid....	22.50	none....	selec..	top worm
Beck.....A	1,080	124	solid....	19.61	ltg-2*...	selec..	int-gear
Bessemer.....G	1,250	124	solid....	19.61	none....	selec..	int-gear
Bethlehem.....A-1	1,245	126	solid*...	22.50	none....	selec..	int-gear
Brinton.....H	1,250	125	pneu*...	16.92	lighting..	selec..	top worm
Briscoe.....T-24	1,000	132	p&s.....	16.92	s&l-2....	selec..	dbl chn
Chase.....A	1,725	138	optional.	19.61	optional.	selec..	top worm
Commerce.....E	1,340	126	solid....	19.61	s,l&i-2...	selec..	int-gear
Concord.....B	1,750	130	p&s*....	19.61	s&l*....	selec..	top worm..
Continental.....FL	1,750	144	solid....	22.50	.....	selec..	top worm
Corbitt.....E	1,650	130	optional.	22.50	s,l&i-2*..	selec..	top worm
Dart.....E	1,800	130	solid....	22.50	s&l-2*...	selec..	top worm
D-E.....A	1,495	128	solid....	19.61	none....	selec..	top worm
Denby.....12	1,490	124	solid....	19.61	s&l.....	selec..	int-gear
Denmo.....10	1,490	124	solid*...	22.50	s&l.....	selec..	int-gear
Diamond-T.....J5	1,725	132	solid....	19.61	none....	selec..	top worm
Federal.....S	1,750	132	solid....	19.61	s&l-2*...	selec..	top worm
Ford.....	600	123	p&s.....	22.50	lighting..	plan..	top worm
Forschler.....A-0	1,815	138	solid....	19.61	.....	selec..	top worm
Gabriel.....C	1,800	136	pneu....	29.00	s&l-2*...	selec..	top worm
Garford.....75B	1,750	128	p&s.....	19.61	s,l&i-2*..	selec..	top worm
Gary.....F		130	solid....	22.50	lighting*	selec..	top worm
Globe.....A-1	1,375	132	solid....	19.61	none....	selec..	int-gear
G.M.C.....21	1,950	136	p&s*....	22.50	opt.....	selec..	top worm
Gramm-Bernstein.....W	1,900	124	solid....	22.50	none....	ind-c..	top worm
Hoover.....15-B	1,375	120	pneu....	19.61	.....	selec..	top worm
Independent.....F	1,385	128*	solid....	19.61	s&l.....	selec..	top worm
Indiana.....T	1,600	135	solid....	19.61	lightg*.	selec..	top worm
I.H.C.....F	1,750*	128*	solid*...	19.61	s&l*....	selec..	int-gear
Kisselkar.....	1,585	152	solid....	24.22	s&l-2*...	selec..	top worm
Kleiber.....AA	2,100	130	solid....	22.50	.....	selec..	top worm
Koehler.....K	1,150	129	solid....	19.61	.....	selec..	int gear
Lambert.....V-2	1,700	144	solid....	29.00	s&l.....	fric...	dbl chn
Lange.....C	1,950	136	solid....	27.20	none....	ind-c..	dbl chn
Larrabee.....M	1,800	130	solid....	22.50	none....	selec..	top worm
Lippard-Stewart.....HW	2,000	135	solid....	22.50	s&l*....	selec..	top worm
Mack.....AB	2,400	144	solid....	25.60	opt.....	selec..	top worm
Mack.....AB	2,400	144	solid....	25.60	opt.....	selec..	dbl chn
Maxfer.....	1,195	130	pneu*...	19.61	s&l.....	selec..	top worm
Maxwell.....	865	124	solid....	21.08	lighting..	selec..	top worm
Menominee.....FW	1,790	130	solid....	22.50	.....	selec..	top worm
Moreland.....	1,900	126	solid....	22.50	lightg*.	selec..	top worm
Nash.....2017	1,495	130	solid*...	22.50	s,l&i-2...	selec.	int-gear
Niles.....B	1,500	124	pneu....	19.61	.....	selec..	top worm
Oneida.....A	2,000	130	solid....	22.50	lighting..	ind-c..	top worm
Palmer.....	1,585	132	solid*...	22.50	.....	prog..	int-gear
Republic.....10	1,195	124	solid....	19.61	s&l*....	selec..	int-gear

ABBREVIATIONS—Types of Construction

*—with other options
cush—cushion
c & s—cushion and solid tires
dbl-chn—double chain drive
dbl-red—double reduction drive
f—drive to front wheels only
4—driving on all four wheels
fric—friction
ind-c—individual clutch, constant mesh
int-gear—internal gear
plan—planetary
pneu—pneumatic
p&s—pneumatic and solid
prog—progressive
selec—selective sliding gearset
sp-bev—spiral bevel
s, l & i—starting, lighting and ignition
s, l & i-2—2-unit starting, lighting and ignition system
s & l-2—2-unit starting and lighting system

Prices are exclusive of the 3 per cent. Government war tax

TRUCKS OF 1-TON CAPACITY (Cont'd)

Name and Model	Chassis Price	Wheel-base, Inches	Tires	N.A.C.C. Horse-power	Elec-tric System	Gear-set Type	Final Drive
Packard 1-E	$2,450	126*	c&s	25.60	s&l-2*	selec.	top worm
Reya 18	995	117	pneu	22.50	s,l&i-2	selec.	bevel
Royal		124	solid	16.92		ind-c.	top worm
Sandow A	1,485	120	solid*	19.61		selec.	top worm
Selden TX	1,550	140	solid	19.61	s&l-2*	selec.	int-gear
Service 220	1,500	137	opt	19.61	s&l-2*	selec.	top worm
Signal F	1,875	144	solid	22.50	none	selec.	top worm
Studebaker	1,350	125	pneu	24.22	s,l&i-2	selec.	bevel
Superior A	1,500	124*	solid	19.61		selec.	int-gear
Taylor	1,750	134	solid	19.61		selec.	top worm
Tiffin AW	1,550	112	solid	19.61	none	selec.	top worm
Wichita A	1,750	110	solid	19.61		selec.	dbl chn
Wichita K	1,750	118	solid	19.61		selec.	top worm
Wilcox S		128	opt	22.50	lightg*	selec.	top worm
Wisconsin B	1,650	136	solid	19.61		selec.	top worm
Witt Will WD-18	2,000	120	solid*	22.50		selec.	top worm

TRUCKS OF 1½-TON CAPACITY

Acason B	$2,100	150	solid	22.50		selec.	top worm
Atterbury 7R	2,275	140½	solid	27.20	none	selec.	top worm
Beck B	1,275	124	solid	19.61	lightg-2*	selec.	int-gear
Brockway J3	2,050	140	solid	22.50	none	selec.	top worm
Chase C	2,025	149½	solid	19.61	opt	selec.	top worm
Clydesdale 45	2,100	146	solid	27.20	none	selec.	top worm
Continental HL	2,100	144	solid	22.50		selec.	top worm
Corbitt D	1,900	138	solid*	22.50	s,l&i-2*	selec.	top worm
D-E B	1,755	144	solid	22.50	none	selec.	top worm
Diamond-T J4	2,200	154	solid	22.50		selec.	top worm
Federal T	2,200	144	solid	22.50	s,l&i-2*	selec.	top worm
Forschler AX	2,200	138	solid	19.61		selec.	top worm
Fulton F2	1,420	136	solid	19.61	opt	selec.	int-gear
Garford 66B	2,100	142	solid	27.50	s,l&i-2*	selec.	top worm
Gary G		144	solid	29.00	lightg*	selec.	top worm
G.M.C. 31	2,350	130	solid	22.50	opt	selec.	top worm
Gramm-Bernstein W	2,300	130	solid	22.50	none	ind-c.	top worm
Hahn	1,950	144*	solid	27.20		selec.	top worm
Hawkeye J	1,750	146	solid*	22.50	s,l&i-2*	selec.	int-gear
Horner 1918	2,600	145	solid	27.20	lighting	selec.	top worm
Hurlburt 1	2,350	136	solid	22.50	lighting	selec.	top worm
Kelly-Springfield K31	2,500	144	solid	22.50	s&l-2*	selec.	dbl-chn*
Kleiber A	2,500	140	solid	27.20		selec.	top worm
Lamson	1,850	150*	solid	25.60		ind-c.	top worm
Lane F	1,750	135	solid	19.61	s,l&i-2	selec.	top worm
Lange C	1,850	130	solid	22.50		ind-c.	dbl chn
Larrabee N	2,000	140	solid	27.20	none	selec.	top worm
Lippard-Stewart F	2,450	158	solid	27.20	s&l*	selec.	top worm
Maccar L	2,400	150	solid	27.20		selec.	top worm
Mack AB	2,800	162*	solid	25.60	opt	selec.	top worm*
Manly 30	2,050	156	solid	22.50	s&l*	selec.	top worm
Menominee H	2,050	144	solid	22.50		selec.	top worm
Moreland	2,500	106	solid	27.20	opt	selec.	top worm
Nelson & LeMoon E	1,900	opt	solid	22.50	s,l&i*	selec.	top worm
New York M	2,200	144	solid	27.20		ind-c.	top worm
Old Reliable	1,950	150*	solid	22.50	lighting	selec.	top worm
Oneida B	2,650	130	solid	27.20	lighting	ind-c.	top worm
Packard 1½-E	2,800	126	c&s	25.60	s&l-2*	selec.	top worm
Republic 11	1,450	144	solid	22.50		selec.	int-gear
Sanford W-15	2,200	140	solid	22.50	s,l&i-2	selec.	top worm
Service 230	2,200	150	solid	25.60	s&l-2*	selec.	top worm
Stewart 9	1,750	140	solid	22.50	—-2*	selec.	int-gear
Sullivan F	2,150	129	solid	22.50		selec.	top worm
Taylor	2,200	142	solid	22.50		selec.	top worm
Tiffin GW	1,970	135	solid	22.50	none	selec.	top worm
Triangle A		144	solid	22.50		selec.	int-gear
Universal G	1,950	133	solid	22.50	lighting	selec.	top worm
White TBC	3,300	145½	p&s	22.50	none	selec.	dbl-red
White Hickory H	2,200	144	solid*	22.50		prog.	top worm
Wichita L	1,950	118	solid	19.61		selec.	top worm
Wilcox X		144	solid	29.00	lightg*	selec.	top worm

TRUCKS OF 2-TON CAPACITY

Name and Model	Chassis Price	Wheel-base, Inches	Tires	N.A.C.C. Horse-power	Elec-tric System	Gear-set Type	Final Drive
Acason H	$2,400	150	solid	29.00		selec.	top worm
Acme A	2,450	148	solid	27.20	lightg*	ind-c.	top worm
Armleder HW	2,750	148	solid	27.20	lightg*	selec.	top worm
Atterbury 7C	2,675	153½	solid	27.20		selec.	top worm
Autocar XXI-F		97	opt	18.10	lightg*	prog.	dbl-red
Available 2	2,450	144	solid	27.20	none	selec.	top worm
Beck C	1,750	144	solid	29.00	lightg-2*	selec.	int-gear
Bessemer D	2,550	146	solid	27.20	none	selec.	top worm
Bessemer J	2,200	158	solid	27.20	none	selec.	int-gear
Bethlehem B-1	1,775	144	solid	25.60	none	selec.	int-gear
Blair C	2,850	144	solid	29.00	none	ind-c.	top worm
Bourne Magnetic VM	3,300	150	solid	25.60	s,l&i-2	selec.	top worm
Brockway K3	2,450	148	solid	27.20	none	selec.	top worm
Burford O3	2,250	144*	solid	22.50	lighting	selec.	int-gear
Clydesdale 65	2,475	163	solid	27.20	none	selec.	top worm
Columbia E-T	1,950	144	solid	27.20	lightg*	selec.	int-gear
Concord A	2,400	145	solid	29.00	s&l*	selec.	top worm
Continental J	2,300	146	solid	27.20		selec.	top worm
Corbitt C	2,650	148	solid	27.20	none	selec.	top worm
Dart CC-4	2,470	150	solid	29.00	s,l&i*	selec.	top worm
Dayton H	2,650		solid	29.00		selec.	dbl chn
Denby 13	2,025	144	solid	22.50	s&l	selec.	int-gear
DeKalb E-2	2,100	134	solid	27.20	none	selec.	top worm
Diamond-T P	2,475	154	solid	27.20		selec.	top worm
Dorris L	2,285	144	solid	29.00	s&l-2*	selec.	top worm
Fageol	2,750	144	solid	25.60		ind-c.	top worm
Fargo P	2,200	146	solid	22.50	s,l&i-2*	selec.	int-gear
Federal U	2,450	156	solid	22.50	s,l&i-2*	selec.	top worm
Forschler BO	2,475	138	solid	27.20		selec.	top worm
Gabriel E	2,500	156	opt	29.00	s&l-2*	selec.	top worm
Garford 70B	2,600	142	solid	29.00	s,l&i-2*	selec.	top worm
Gary H		156	solid	29.00	lightg*	selec.	top worm
G.A.Schacht	2,750	138	solid	29.00	none	selec.	top worm
Gersix C	2,500	150*	solid	33.75	s&l	ind-c.	top worm
G.M.C. 41	2,690	144*	solid	27.20	opt	selec.	top worm
Gramm-Bernstein W-2	2,600	146	solid	22.50	none	ind-c.	top worm
Hall	2,350	144	solid	27.20	lightg*	selec.	top worm
Hendrickson G			solid	29.00			top worm
Horner 1918	2,750	145	solid	15.64	lighting	selec.	top worm
Hurlburt 2	3,300	148	solid	29.00	none	selec.	top worm
I.H.C. G	2,500	135½	solid*	25.60	s&l*	selec.	int-gear
Indiana D	2,350	150	solid	27.20		selec.	top worm
Independent G	1,850	144	solid	27.20		selec.	top worm
Kisselkar	2,275	168	solid	29.00	s&l2*	selec.	top worm
Kleiber BB	2,750	140	solid	27.20		selec.	top worm
Lange B	2,650	136	solid	27.20	none	ind-c.	dbl chn
Lippard-Stewart G	2,700	165	solid	27.20	s&l*	selec.	top worm
Lumb C	1,900	148	opt	29.00	lighting	selec.	int-gear
Mack AB	3,000	162	solid	25.60	opt	selec.	top worm*
Manly 40	2,250	156	solid	22.50	s&l*	selec.	top worm
Master M	1,990	144*	solid	29.00		selec.	int-gear
Menominee D	2,475	144	solid*	27.20		selec.	top worm
Muskegon 20	2,200	144	solid	27.20	lightg*	selec.	int-gear
Nash Quad 4017	3,250	124	solid	29.00	s&l-2*	selec.	int-gear-4
Nelson & LeMoon E2	2,250	opt	solid	27.20	s,l&i*	selec.	top worm
Netco D	2,500	144	solid	27.20	none	selec.	top worm
New York N	2,600	144	solid	27.20		ind-c.	top worm
Niles E	2,400	140	solid	27.20		selec.	top worm
Noble NW-2	2,300	148	solid	27.20	opt		top worm
Old Reliable	2,450	150	solid	25.60	lighting	selec.	top worm
Oneida C	3,000	144	solid	27.20	lighting	ind-c.	top worm
Packard 2-E	3,200	144	solid	25.60	s&l-2*	selec.	top worm
Palmer	2,275	144	solid	27.20		prog.	top worm
Peerless TC-2	3,000	145	solid	32.40	lightg*	selec.	top worm
Pierce-Arrow	3,300	150	solid	25.60	s,l&i-2*	selec.	top worm
Reo J	1,800	146	solid	27.20	s,l&i-2*	selec.	dbl chn
Republic A	1,885	144	solid	27.20		selec.	int-gear
Rowe CDW	2,800	142	solid	25.60		selec.	top worm
Sandow B	2,450	165	solid	27.20		selec.	top worm
Selden B		162	solid	27.20	s&l-2*	selec.	top worm
Service 240	2,500	160	solid	29.00	s&l-2*	selec.	top worm
Signal H	2,375	144	solid	27.20	none	selec.	top worm
Standard 70	2,500	140	solid	27.20	none	selec.	top worm
Steele C	2,250	115*	solid	27.20	lighting	ind-c.	dbl chn
Stegeman	2,600	150	solid	29.45	s&l-2	selec.	top worm
Stewart 7	2,195	156	solid	27.20		selec.	int-gear
Sullivan E	2,600	150	solid	27.20		selec.	top worm
Superior C	2,000	144	solid	22.50		selec.	int-gear

ABBREVIATIONS—Types of Construction

*—with other options
cush—cushion
c & s—cushion and solid tires
dbl-chn—double chain drive
dbl-red—double reduction drive
f—drive to front wheels only
4—driving on all four wheels
fric—friction
ind-c—individual clutch, constant mesh
int-gear—internal gear
plan—planetary
pneu—pneumatic
p&s—pneumatic and solid
prog—progressive
selec—selective sliding gearset
sp-bev—spiral bevel
s, l & i—starting, lighting and ignition
s, l & i-2—2-unit starting, lighting and ignition system
s & l-2—2-unit starting and lighting system

Prices are exclusive of the 3 per cent Government war tax

TRUCKS OF 2-TON CAPACITY (Cont'd)

Name and Model	Chassis Price	Wheel-base, Inches	Tires	N.A.C.C. Horse-power	Elec-tric System	Gear-set Type	Final Drive
Thomas.....40	$3,000	150	solid....	29.00	lighting..	selec..	top worm
Universal.....D	2,800	132	solid....	29.00	lighting..	selec..	dbl chn
U. S.....E	2,650	144	solid....	27.20	lightg*..	ind-c..	dbl chn
U. S.....H	2,950	144	solid....	27.20	lightg*..	ind-c..	top worm
Velie.....25-A	2,750	150	solid....	27.20	s??	selec..	top worm
Wichita.....B	2,250	118	solid....	19.61	s&l*....	selec..	dbl chn
Wilcox.....Q	4,000	150	solid....	32.40	lightg*..	selec..	top worm
Wilson.....	2,550	144	solid....	27.20	opt.....	selec..	top worm
Winther.....47	2,800	150	solid....	25.60	opt.....	prog..	int-gear

TRUCKS OF 2½-TON CAPACITY

Brinton.....F	$2,400	140	solid....	27.20	none....	selec..	top worm
Chase.....B	2,475	160	solid....	27.20	opt.....	selec..	top worm
Corbitt.....B	2,900	148	solid....	27.20	none....	selec..	top worm
D-E.....C	2,365	150	solid....	29.00	none....	selec..	top worm
DeKalb.....E	2,450	136	solid....	27.20	none....	selec..	top worm
Doane.....	3,000	150	solid....	29.00	.....	selec..	dbl chn
Gary.....HU	.....	162	solid....	29.00	lightg*..	selec..	top worm
G.A.Schacht.....	3,000	156	solid....	29.00	none....	selec..	top worm
Gramm-Bernstein.....W	3,150	156	solid....	29.00	opt.....	ind-c..	top worm
Harvey.....W.F.A.	2,500	150	solid....	29.00	s,l&i....	selec..	top worm
Kelly-Springfield.....35	3,000	144	solid....	22.50	s&l-2*...	selec..	top worm*
Kleiber.....B	3,200	150	solid....	32.40	lighting..	selec..	top worm
Lamson.....	2,450	160*	solid....	25.60	lighting..	ind-c..	top worm
Lane.....B	2,500	150	solid....	29.45	s,l&i-2...	selec..	top worm
Lange.....B	2,450	136	solid....	27.20	.....	ind-c..	dbl chn
Larrabee.....O	2,700	154	solid....	27.20	none....	selec..	top worm
Maccar.....H	2,950	162	solid....	32.40	none....	selec..	top worm
Manly.....50	2,600	168	solid....	25.60	s&l*....	selec..	top worm
Moreland.....	3,000	144	solid....	32.40	none....	selec..	top worm
Old Reliable.....	2,750	.....	solid....	29.00	.....	selec..	dbl chn
Rennac.....	3,250	144	solid....	27.20	lighting..	selec..	top worm
Rowe.....CDW	3,000	164	solid....	25.60	.....	selec..	top worm
Royal.....	.....	132*	solid....	25.60	.....	ind-c..	top worm
Sanford.....W-25	2,800	156	solid....	27.20	none....	selec..	top worm
Selden.....BR	.....	162	solid....	27.20	s&l-2*..	selec..	int-gear
Signal.....J	2,835	150	solid....	27.20	none....	selec..	top worm
Sterling.....	2,950	156	solid....	29.00	none....	selec..	top worm
Taylor.....	2,900	145	solid....	27.20	.....	selec..	top worm
Tiffin.....MC	2,500	140	solid....	27.20	none....	selec..	dbl chn
Tiffin.....MW	2,700	140	solid....	27.20	none....	selec..	top worm
Union.....B	1,000	152	solid....	25.60	lightig*..	selec..	int-gear
Wichita.....R	2,500	144	solid....	22.50	.....	selec..	top worm
Wisconsin.....C	2,500	156	solid....	25.60	.....	selec..	top worm
Witt Will.....WD-18	2,500	144	solid*...	27.20	none....	selec..	top worm

TRUCKS OF 3-TON CAPACITY

A&B.....3T	$4,500	144	solid....	42.76	.....	elec...	int-gear-f
Beech Creek.....3A	3,850	132	solid....	29.00	.....	selec..	bevel
Blair.....D	3,250	144	solid....	29.00	none....	ind-c..	top worm
Chase.....X	2,800	160	solid....	27.20	opt.....	selec..	top worm
Denby.....15	2,525	144	solid....	22.50	s&l.....	selec..	int-gear
F.W.D.....B	4,000	124	solid....	36.15	s&l*....	ind-c..	bevel-4
Gary.....K	.....	162	solid....	32.40	lightg*..	selec..	top worm
Horner.....	3,550	145	solid....	32.40	lighting..	selec..	top worm
Lapeer.....A	1,500	90	solid....	19.61	.....	selec..	int-gear
Manly.....60	3,000	168	solid....	29.00	s&l*....	selec..	top worm
Nelson & LeMoon....E-3	2,950	Opt.	solid....	32.40	s,l&i*...	selec..	top worm
Old Reliable.....	3,250	150	solid....	29.00	lighting..	selec..	top worm
Peerless.....TC-3	3,700	151	solid....	32.40	lightg*..	selec..	dbl chn
Pull-More.....	3,400	153	solid....	32.40	.....	selec..	dbl chn

TRUCKS OF 3-TON CAPACITY (Cont'd)

Name and Model	Chassis Price	Wheel-base, Inches	Tires	N.A.C.C. Horse-power	Elec-tric System	Gear-set Type	Final Drive
Riker.....B	$3,900	150	solid....	29.00	s&l*....	selec..	top worm
Schleicher.....	3,500	150*	solid....	29.00	.....	selec..	dbl chn
Steele.....B	3,000	127*	solid....	40.00	lighting..	ind-c..	dbl chn
Stegeman.....	3,000	160	solid....	29.45	s&l-2....	selec..	top worm
United F.W.D.....B	4,000	130	solid....	34.28	lightg-2*	ind-c..	bevel-4
White.....TAD	4,100	163	solid....	22.50	.....	selec..	dbl chn
Winther.....67	3,600	150	solid....	25.60	opt.....	prog..	int-gear

TRUCKS OF 3½-TON CAPACITY

Acason.....L	$3,000	166	solid....	29.00	.....	selec..	top worm
Acme.....C	3,250	168	solid....	32.40	lightg*..	ind-c..	top worm
American.....30	3,450	158	solid....	32 40	opt.....	selec..	top worm
Armleder.....KW	3,600	156	solid....	32.40	lightg*..	selec..	top worm
Atterbury.....7D	3,575	167½	solid....	32.40	.....	selec..	top worm
Available.....3	3,450	156	solid....	32.40	none....	selec..	top worm
Bessemer.....E	3,450	150	solid....	32.40	none....	selec..	top worm
Bourne Magnetic.....XM	4,000	160	solid....	29.00	s,l&i-2...	selec..	top worm
Brockway.....R	3,200	164	solid....	32.40	none....	selec..	top worm
Burford.....D3	3,600	175*	solid....	32.40	lighting..	selec..	top worm
Chase.....O	3,600	175	solid....	29.00*	opt.....	selec..	top worm
Clydesdale.....90	3,400	180	solid....	32.40	none....	selec..	top worm
Continental.....M	3,300	168*	solid....	32.40	.....	selec..	top worm
Corbitt.....A	3,800	168	solid....	32.40	none....	ind-c..	top worm
Couple-Gear.....HC	5,600	144*	solid....	44.20	lighting..	selec..	bevel
Dart.....L	3,400	160	solid....	32.40	opt.....	selec..	top worm
Dayton.....	3,400	.....	solid....	29.00	.....	selec..	top worm
Dayton.....K	3,400	.....	.....	36.15	.....	selec..	dbl chn
Diamond-T.....N	3,750	170	solid....	32.40	.....	selec..	top worm
Duplex.....D	3,600	130*	solid....	29.00	s&l.....	ind-c..	int-gear
Federal.....W	3,150	156	solid....	29.00	s&l-2*...	selec..	top worm
Gabriel.....F	3,250	168	solid*...	32.40	s&l-2*..	selec..	top worm
Garford.....77B	3,700	128	solid....	29.00	s,l&i-2*..	selec..	top worm
G.A.Schacht.....	3,400	168	solid....	29.00	none....	selec..	top worm
G.M.C.....71	3,750*	187*	solid....	32.40	.....	selec..	top worm
Gramm-Bernstein.....W	3,800	158	solid....	32.40	s,l&i-2*..	ind-c..	top worm
Hahn.....	2,900	148*	solid....	32.40	.....	selec..	top worm*
Hall.....	3,250	144	solid....	32.40	lightg*..	selec..	top worm
Harrison.....C	.....	.....	solid....	32.40	.....	selec..	dbl chn
Harrison.....F	.....	.....	solid....	32.40	.....	selec..	dbl chn
Harrison.....WHA	3.250	166	solid....	32.40	s,l&i....	selec..	top worm
Harvey.....H	3,000	.....	solid....	32.40	lightg*..	prog..	top worm
Hendrickson.....	3,000	.....	solid....	32.40	lightg*..	prog..	top worm
Hurlburt.....3	3,850	146	solid....	32.40	none....	selec..	top worm
Indiana.....R	3,000	156	solid....	29.00	none....	selec..	top worm
Kelly-Springfield.....K40	3,850	150	solid....	32.40	s&l-2*..	selec..	dbl chn
King.....	2,800	120	solid....	32.40	none....	ind-c..	dbl chn
Kisselkar.....	3,150	168	solid....	29.00	s&l*....	selec..	top worm
Kleiber.....C	3,850	160	solid....	32.40	lighting..	selec..	top worm
Lamson.....	3,150	170*	solid....	36.15	lighting..	ind-c..	top worm
Lane.....C	3,250	160	solid....	33.75	s.l&i-2...	selec..	top worm
Larrabee.....R	3,400	154	solid....	32.40	none....	selec..	top worm
Maccar.....M	3,600	174	solid....	32.40	none....	selec..	top worm
Mack.....AC	4,250	180	solid....	40.00	opt.....	selec..	dbl chn
Menominee.....G	3,275	160	solid....	32.40	none....	selec..	top worm
Oneida.....D	3,600	160	solid....	32.40	lighting..	ind-c..	top worm
Republic.....T	2,750	165	solid....	29.00	.....	selec..	int-gear
Rowe.....DEW	3,400	158*	solid....	29.00	.....	ind-c..	top worm
Royal.....	.....	158*	solid....	29.00	.....	ind-c..	top worm
Sanford.....W35	3,600	174	solid....	32.40	none....	selec..	top worm
Selden.....C	.....	180	solid....	32.40	s&l-2*...	selec..	top worm
Service.....270	3,300	171	solid....	29.00	s&l-2*...	selec..	top worm
Service.....275	3,600	171	solid....	32.40	s&l-2*...	selec..	top worm
Standard.....65	3.200	156	solid....	32.40	none....	selec..	top worm
Sterling.....	3,900	162	solid....	29.00	lighting..	ind-c..	top worm
Taylor.....	3,650	156	solid....	32.40	.....	selec..	top worm
Thomas.....70	3,500	150	solid....	29.00	lighting..	selec..	top worm
Tiffin.....PW	3,400	156	solid....	32.40	none....	selec..	top worm
U.S.....D	3,350	162	solid....	32 40	lightg*..	ind-c..	dbl chn
U.S.....J	3,650	162	solid....	32.40	lightg*..	ind-c..	top worm
Universal.....L	.....	156	solid....	29.00	lighting..	selec..	dbl chn
Velie.....26A	3,600	172½	solid....	32.40	.....	selec..	top worm
Ware.....	4,000	140	solid....	42.20	lightg*..	selec..	bevel-4
Wichita.....O	3,450	165	solid....	32.40	lightg*..	selec..	top worm
Wilcox.....P	2,900	154	solid....	29.00	lightg*..	selec..	top worm
Wilson.....	3,250	156	solid....	32.40	opt.....	selec..	top worm

ABBREVIATIONS—Types of Construction

*—with other options
cush—cushion
c & s—cushion and solid tires
dbl-chn—double chain drive
dbl-red—double reduction drive
f—drive to front wheels only
4—driving on all four wheels
fric—friction
ind-c—individual clutch, constant mesh
int-gear—internal gear
plan—planetary
pneu—pneumatic
p&s—pneumatic and solid
prog—progressive
selec—selective sliding gearset
sp-bev—spiral bevel
s, l & i—starting, lighting and ignition
s, l & i-2—2-unit starting, lighting and ignition system
s & l-2—2-unit starting and lighting system

Prices are exclusive of the 3 per cent Government war tax

TRUCKS OF 4-TON CAPACITY

Name and Model	Chassis Price	Wheelbase, Inches	Tires	N.A.C.C. Horsepower	Electric System	Gearset Type	Final Drive
Kelly-Springfield.....K45	$4,000	150	solid....	32.40	s&l-2*...	selec..	dbl chn
Moreland.....	3,800	162	solid....	36.15	none....	selec..	top worm
Old Reliable.....	3,750	.....	solid....	36.15	lighting..	selec..	top worm
Old Reliable.....	3,750	.....	solid....	36.15	lighting..	selec..	dbl chn
Packard.....3-E	3,900	156	solid....	32.40	s&l-2*...	selec..	top worm
Peerless.....TC-4	4,000	151	solid....	32.40	light-2*..	selec..	dbl chn
Riker.....BB	4,050	150	solid....	29.00	s&l*....	selec..	top worm
Signal.....M	3,825	168	solid....	32.40	none....	selec..	top worm
Steele.....BA	3,500	127*	solid....	40.00	lighting..	ind-c..	dbl chn
Stegeman.....	3,800	160	solid....	33.75	s&l-2....	selec..	top worm
Winther.....87	4,000	156	solid....	29.00	opt.....	prog..	int-gear

TRUCKS OF 5-TON CAPACITY

A&B.....5T	$4,750	144	solid....	42.76	.....	elec...	int-gear-f
Acason.....M	4,200	172	solid....	36.15	.....	selec..	top worm
Available.....	4,500	156	solid....	32.40	none....	selec..	top worm
Blair.....F	4,250	144	solid....	32.40	none....	ind-c..	top worm
Clydesdale.....120	4,200	180	solid....	32.40	.....	selec..	top worm
Corbitt.....AA	4,200	168	solid....	32.40	none....	ind-c..	top worm
Couple-Gear.....AC	6,400	144*	solid....	44.20	lighting..	elec...	bevel
Dayton.....M	4,500	.....	solid....	44.20	.....	selec..	dbl chn
Diamond-T.....R	4,600	170	solid....	32.40	.....	selec..	top worm
Federal.....X	4,200	156	solid....	29.00	opt.....	selec..	top worm
Garford.....68	4,500	128	solid....	36.15	s,l&i-2*..	selec..	dnl-chb
G.A.Schacht.....	4,400	168	solid....	29 00	none....	selec..	top worm
G.M.C.....101	4,350*	187*	solid....	32.40	lightg*..	selec..	top worm
Gramm-Bernstein.....W5	4,700	168	solid....	36.15	s,l&i-2*..	ind-c..	top worm
Hall.....	4,200*	144	solid....	32.40	lightg*..	selec..	top worm*
Harvey.....WK-A	4,000	160	solid....	32.40	s,l&i....	selec..	top worm
Horner.....1918	4,750	156	solid....	44.20	lighting..	selec..	top worm
Hurlburt.....	4,600	156	solid....	33.75	none....	selec..	top worm
Indiana.....L	4,000	168	solid....	36.15	.....	selec..	top worm
Kelly-Springfield.....K50	4,600	150	solid....	32.40	s&l-2*..	selec..	dbl chn
Kleiber.....D	4,900	170	solid....	44.20	lightg*..	selec..	top worm
Lamson.....	4,150	180*	solid....	41.62	s&l.....	ind-c..	top worm
Lombard.....	.....	.....	steel....	79.50	none....	selec..	creeper
Moreland.....	4,500	168	solid....	36.15	none....	selec..	top worm
Nelson LeMoon.....E5	3,750	opt.	solid....	32.40	s,l&i*...	selec..	top worm
Old Reliable.....	4,500	150*	solid....	36.15	lighting..	selec..	dbl chn
Peerless.....TC	4,500	151	solid....	32.40	lightg*..	selec..	dbl chn
Packard.....4E	4,375	156	solid....	32.40	s&l-2*..	selec..	top worm
Pierce-Arrow.....	5,000	168	solid....	38.25	s&l*....	selec..	top worm
Republic.....V	4,250	160	solid....	32.40	none....	selec..	nt-gear
Rowe.....GW	4,500	171	solid....	46.15	.....	selec..	top worm
Royal.....	.....	168*	solid....	36.15	.....	ind-c..	top worm
Schleicher.....	4,500	150*	solid....	40.00	.....	selec..	dbl chn
Selden.....D	.....	169	solid....	36.15	s&l-2*..	selec..	top worm
Service.....300	4,300	171½	solid....	32.40	s&l-2*..	selec..	top worm
Signal.....R	4,475	180	solid....	32.40	none....	selec..	top worm
Standard.....85	.....	156	solid....	32.40	none....	selec..	top worm
Steele.....A	4,000	127*	solid....	40.00	lighting..	ind-c..	dbl chn
Stegeman.....	4,500	168	solid....	38.40	s&l-2....	selec..	top worm
Sterling.....	4,750	168	solid....	36.15	lighting..	ind-c..	top worm
Taylor.....	4,600	160	solid....	44 20	.....	selec..	top worm
Tiffin.....RW	4,550	168	solid....	33.75	s,l&i-2..	selec..	top worm
Titan.....	5,000	156	solid....	32.40	lighting..	ind-c..	int-gear
U.S.....K	4,550	168	solid....	36.15	lightg*..	ind-c..	top worm
Walter.....F	5,000	156	solid*....	36.15	s,l&i....	selec..	int-gear-4
White.....TCD	5,000	169	solid....	29.00	.....	selec..	dbl chn
Wichita.....Q	4,000	165	solid....	32.40	s&l-2....	selec..	top worm
Wilcox.....W	.....	162	solid....	36.15	lightg*..	selec..	top worm
Wilson.....	.....	156	solid....	32.40	opt.....	selec..	top worm
Winther.....107	4,600	162	solid....	36.15	s&l.....	prog..	int-gear

TRUCKS OF 5½-TON CAPACITY

Name and Model	Chassis Price	Wheelbase nche	Tires	N.A.C.C. Horsepower	Electric System	Gearset Type	Final Drive
Maccar.....U	$4,500	186	solid....	32.40	.....	selec..	top worm
Mack.....AC	4,750	180	solid....	40.00	opt.....	selec..	dbl chn

TRUCKS OF 6-TON CAPACITY

Doane.....	$4,750	178	solid....	36.15	.....	selec..	dbl chn
Garford.....69	4,700	128	solid....	42.20	s,l&i-2*..	selec..	dbl chn
Garford-Road.....	5,650	128	steel....	42.20	.....	selec.	dbl chn
G.V. Mercedes.....	.....	192¼	solid....	29.00	.....	selec..	int-gear
Kelly-Springfield.....K60	4,750	150	solid....	32.40	s&l-2*...	selec..	dbl chn
Packard.....5E	4,900	156	solid....	40.00	s&l-2*..	selec..	top worm
Peerless.....TC-6	5,000	151	solid....	32.40	lightg*..	selec..	dbl chn
Royal.....	.....	158*	solid....	42.20	.....	ind-c..	top worm
Tiffin.....SW	4,650	168	solid....	33.75	s,l&i-2...	selec..	top worm
Winther.....127	5,000	162	solid....	42.20	s&l.....	prog..	int-gear

TRUCKS OF 7-TON CAPACITY

Hurlburt.....	$5,500	156	solid....	33.75	none....	selec..	top worm
Old Reliable.....	5,000	150	solid....	41.62	lighting..	selec..	dbl chn
Packard.....6E	5,150	156	solid....	40.00	s&l-2*..	selec..	top worm
Royal.....	.....	158*	solid....	44.20	.....	ind-c..	dbl chn
Stegeman.....	5,000	168	solid....	38.40	s&l-2....	selec.	top worm
Sterling.....	5,250	168	solid....	36.15	lightg....	ind-c..	dbl chn
Western.....	4,600	146	solid....	36.15	lightg*..	selec..	dbl chn

TRUCKS OF 7½-TON CAPACITY

Dayton.....E	$4,950	.....	solid....	44.20	.....	selec..	dbl chn
Mack.....AC	5,000	180	solid....	40.00	opt.....	selec.	dbl chn

TRACTORS

Acason.....	$2,500	114	solid....	29.00	.....	selec..	top worm
Acason.....	3,800	130	solid....	36.15	.....	selec..	top worm
Barber.....3	2,500	84	solid....	29.00	none....	selec..	top worm
Harvey.....HT	4,000	125	solid....	32.40	s,l&i....	selec..	top worm
Highway.....A	.....	93	solid....	22.50	none....	selec..	int-gear
Knox.....35	4,500	108½	solid....	40.00	s&l-2....	selec..	dbl chn
Knox Towing.....36	5,000	108½	solid....	40.00	s&l-2....	selec..	dbl chn
Koehler.....KT	1,550	106	solid....	19.61	.....	selec..	int-gear
Lapeer.....C	1,900	90	solid....	19.61	none....	selec..	int-gear
Mack.....AB	3,100	120	solid....	25.60	opt.....	selec..	dbl chn
Mack.....AC	4,250	119	solid....	40.00	opt.....	selec..	dbl chn
Mack.....AC	4,750	119	solid....	40.00	opt.....	selec..	dbl chn
Mack.....AC	5,000	119	solid....	40.00	opt.....	selec..	dbl chn
Rennoc.....	3,250	116	solid....	2.720	lighting..	selec..	top worm
Transport.....T	2,750	80	solid....	22.50	none....	selec..	top worm
Transport.....T	2,750	80	solid....	19.60	.....	selec	op worm
Watson.....	4,050	80	solid....	32.40	none....	selec..	top worm

ABBREVIATIONS—Types of Construction

*—with other options
cush—cushion
c & s—cushion and solid tires
dbl-chn—double chain drive
dbl-red—double reduction drive
f—drive to front wheels only
4—driving on all four wheels
fric—friction
ind-c—individual clutch. constant mesh
int-gear—internal gear
plan—planetary
pneu—pneumatic
p&s—pneumatic and solid
prog—progressive
selec—selective sliding gearset
sp-bev—spiral bevel
s, l & i—starting, lighting and ignition
s, l & i-2—2-unit starting, lighting and ignition system
s & l-2—2-unit starting and lighting system

Prices are exclusive of the 3 per cent Government war tax

Technical Specifications of Gaso

Details of 475 Gasoline, Electric and Steam Motor Truck Chassis of Types of Engines, Transmissions, Controls

Name and Model	Tons Capacity	Chassis Price	Wheelbase, Inches	FRAME			TIRES			Wheels	ENGINE																
							Size in Ins.																				
				Make	Material	Type	Kind	Front	Rear		Make	No. Cyl. Bore and Stroke—N.A.C.C., Hp.	Cylinders Cast	COOLING			IGNITION			ELEC. SYSTEM				GOVERNOR		
														Water Circ.	Radiator		Type	Make	Spark Advance	Type	Make	Extra Cost	Type	Make	Drive	
															Make	Core and Case											
A. & B.....3T	3	$4,500	144	own...	rol-c.	s-flx..	s....	48x3½d	48x3½d	wd..	own..	4-5.17x4½-42.8	2	gear...	Bush.	fin-sht...	dual.-	Bosch.	hand-	none..	none..	....	none.	none....	.....		
A. & B.....5T	5	4,750	144	own...	rol-c.	s-flx..	s....	48x3½d	48x5d	wd..	own..	4.-517x4½-42.8	2	gear...	Bush.	fin-sht...	dual.-	Bosch.	hand-	none..	none..	....	none.	none....	.....		
Acason.....B	1½	2,100	150	.....	p-stl.	.....	s....	34x3½s	36x5s	wd..	Wau..	4-3½x5½-22.5	2	cent...	own..	cel-cst..	sing..	Eismn	hand-	.....	.....	.....	cent-	Wau....	motor.		
Acason.....H	2	2,400	150	.....	p-stl.	.....	s....	34x4s	36x7*	wd..	Wau..	4-4½x5½-28.9	2	cent...	own..	cel-cst..	sing..	Eismn	hand-	.....	.....	.....	cent-	Wau....	motor.		
Acason.....L	3½	3,000	166	.....	p-stl.	.....	s....	34x5s	36x5d	wd..	Wau..	4-4½x5½-28.9	2	cent...	own..	cel-cst..	sing..	Eismn	hand-	.....	.....	.....	cent-	Wau....	motor.		
Acason.....M	5	4,200	172	.....	p-stl.	.....	s....	36x6s	40x6d*	wd..	Wau..	4-4½x6½-36.1	2	cent...	own..	cel-cst..	sing..	Eismn	hand-	.....	.....	.....	cent-	Wau....	motor.		
Acason.....Tractor	.....	2,500	114	.....	.....	.....	s....	34x4s	36x7s*	wd..	Wau	4-4½x5½-28.9	2	cent...	own..	cel-cst..	sing..	Eismn	hand-	.....	.....	.....	cent-	Wau....	motor.		
Acason.....Tractor	.....	3,800	130	.....	p-stl.	.....	s....	34x5s	36x6d	wd..	Wau	4-4½x6½-36.1	2	cent...	own..	cel-cst..	sing..	Eismn	hand-	.....	.....	.....	cent-	Wau....	motor.		
Acme.....B	1	1,750	130	.....	p-stl.	s-flx..	s....	34x3s	34x4s	wd..	Con..	4-3½x5 -22.5	4	ther...	Long.	fin-sht...	sing..	Eismn	hand-	.....	G&D--	100	cent-	Pierce...	motor.		
Acme.....A	2	2,450	148	.....	p-stl.	s-flx..	s....	36x4s	36x6s	wd..	Con..	4-4½x5½-27.2	4	cent...	Long.	fin-sht...	sing..	Eismn	hand-	ltg....	G&D--	75	cent-	Pierce...	motor.		
Acme.....C	3½	3,250	168	.....	rol-c.	s-flx..	s....	36x5s	40x5d	wd..	Con..	4-4½x5½-32.4	2	cent...	Long.	fin-cst..	sing..	Eismn	hand-	ltg....	G&D--	75	cent-	Pierce...	motor.		
American.....3f	3½	3,450	158	Dtrt..	p-stl.	rigid.	s....	36x5s	36x5d	wd..	Con..	4-4½x5½-32.4	2	cent...	Long.	fin-cst..	sing..	Eismn	hand-	opt...	opt.....	.....	cent-	Pierce...	motor.		
Armleder.....HW	2	2,750	148	Smth--	p-stl.	flex..	s....	36x4s	36x7s	wd..	Con..	4-4½x5½-27.2	4	cent...	Long.	fin-cst..	sing..	Eismn	hand-	ltg....	opt.....	.....	cent-	Pierce...	shaft..		
Armleder.....KW	3½	3,600	156	.....	rol-i.	flex..	s....	36x5s	36x5d	wd..	Con..	4-4½x5½-32.4	2	cent...	Long.	fin-cst..	sing..	Eismn	hand-	opt...	opt.....	.....	cent-	Pierce...	shaft..		
Atlas.....18	½	885	106	Prsh..	p-stl.	flex..	pnu..	31x4	31x4	wd.	Lyc..	4-3½x5 -16.9	4	ther...	.....	cel-sht..	sing..	.....	.....	.....	Remy..	.....	.....	.....	.....		
Atterbury.....7R	1½	2,275	140½	.....	p-stl.	flex..	s....	36x3½s	36x5s	wd..	Con..	4-4½x5½-27.2	4	cent...	own..	fin-cst..	sing..	Eismn	fixed	none..	none..	.....	cent-	Pierce...	motor.		
Atterbury.....7C	2	2,675	153½	.....	p-stl.	flex..	s....	36x3½s	36x4d	wd..	Con..	4-4½x5½-27.2	4	cent...	own..	fin-cst..	sing..	Eismn	fixed	none..	none..	.....	cent-	Pierce...	motor.		
Atterbury.....7D	3½	3,575	167½	.....	p-stl.	flex..	s....	36x5s	40x5d	wd..	Con..	4-4½x5½-32.4	2	cent...	own..	fin-cst..	sing..	Eismn	hand.	none..	none..	.....	cent-	Pierce...	motor.		
Autocar.....XXI-F	2	1,815	97	.....	p-stl.	.....	opt..	34x4s	34x5s	wd.	own..	2-4½x4½-18.1	1	cent...	own..	fin-sht...	sing..	Bosch*	fix...	ltg....	opt.....	.....	.....	.....	.....		
Available.....1	1	1,775	132	.....	rol-c.	s-flx..	s....	36x3½s	36x5s	wd..	Con..	4-3½x5 -22.5	4	ther...	Chgo	cel-sht...	sing..	Bosch.	fix...	none..	none..	.....	none.	none....	.....		
Available.....2	2	2,450	144	.....	rol-c.	s-flx..	s....	36x4s	36x7s	wd.	Con..	4-4½x5½-27.2	4	cent...	Chgo	cel-sht...	sing..	Bosch.	fix...	none..	none..	.....	none.	none....	none..		
Available.....3	2½	3,450	156	.....	rol-c.	s-flx..	s....	36x5s	40x5d	wd.	Con..	4-4½x5½-32.4	2	cent...	Chgo	cel-cst..	sing..	Bosch.	fix...	none..	none..	.....	cent-	Pierce...	motor.		
Available.....5	5	4,500	156	.....	rol-c.	s-flx..	s....	36x6s	40x6d	wd.	Con..	4-4½x5½-32.4	2	cent...	Chgo	cel-cst..	sing..	Bosch.	fix...	none..	none..	.....	cent-	Pierce...	motor.		
Avery.....B	2	2,700	128	.....	.....	.....	s....	36x4	36x3½d	.....	.....	4-4½x5 -36.1	1	cent...	.....	.....	.....	Eismn	.....	.....	.....	.....	cent-	.....	motor.		
Avery.....B	3	3,200	128	.....	.....	.....	s....	38x5	38x4d	.....	.....	4-4½x5 -36.1	1	cent...	.....	.....	.....	Eismn	.....	.....	.....	.....	cent-	.....	motor.		
Avery.....A	3	2,500	140	.....	.....	.....	s....	38x5	38x4d	wd..	.....	4-4½x5 -36.1	1	cent...	.....	.....	.....	.....	.....	.....	.....	.....	cent-	.....	motor.		
Barber Tractor.....3	6	2,500	84	own...	rol-c	rigid.	s....	34x3½s	34x7s	wd..	Buda	4-4½x5½-28.9	4	cent...	own..	sq-t-ci..	dual.-	Bosch.	hand-	none..	none..	.....	none.	none....	.....		
Beck.....A	1	1,080	124	P&B..	p-stl	rigid.	s....	34x3s	34x4s	wd..	Con..	4-3½x5 -19.6	2	ther...	Idl...	cel-p-s..	dual.-	Bosch.	fix..	ltg2..	Vesta.	80	cent-	Pierce...	motor.		
Beck.....B	1½	1,275	124	P&B..	p-stl	rigid.	s....	34x3s	34x5s	wd..	Con..	4-3½x5½-19.6	4	ther...	Idl...	cel-p-s..	dual.-	Bosch.	fix..	ltg....	Vesta.	80	cent-	Pierce...	motor.		
Beck.....C	2	1,750	144	P&B..	p-stl	.....	s....	34x4s	34x6s	wd..	Con..	4-4½x5½-28.9	2	gear...	Idl...	cel-p-s..	dual.-	Bosch.	fix..	ltg....	Vesta.	80	cent-	Pierce...	motor.		
Beech Creek.....2A	3	3,850	132	Prsh	.....	.....	s....	36x6	36x6	.....	Wau.	4-4½x5½-28.9	2	cent...	.....	.....	.....	.....	.....	.....	.....	.....	cent-	Wau....	motor.		
Bessemer.....G	1	1,250	124	Savg.	p-stl.	rigid.	s....	34x3s	34x4s	wd..	Con..	4-3½x5 -19.6	4	ther...	Idl...	cel-sht...	sing..	Splf..	hand-	none..	none..	.....	none.	none....	.....		
Bessemer.....L	2	2,550	146	Savg.	p-stl.	rigid.	s....	36x4s	36x4d	wd..	Con..	4-4½x5½-27.2	4	pump.	Idl...	cel-cst..	sing..	Splf..	hand-	none..	none..	.....	cent-	Pierce...	motor.		
Bessemer.....J	2	2,200	158	Savg.	p-stl.	rigid.	s....	36x4s	36x4d	wd.	Con..	4-4½x5½-27.2	4	cent...	Idl...	cel-cst..	sing..	Spltf..	hand-	none..	none..	.....	cent-	Pierce...	motor.		
Bessemer.....E	3½	3,450	150	Savg.	p-stl.	rigid.	s....	36x5s	36x5d	wd.	Con..	4-4½x5½-32.4	2	cent...	Idl...	cel-cst..	sing..	Spltf..	hand-	none..	none..	.....	cent-	Pierce...	motor.		
Bethlehem.....A1	1½	1,245	126	Dtrt..	p-stl.	s-flx..	opt..	34x3s	34x4s	wd.	GBS.	4-3½x4½-22.5	4	ther...	Fed..	z-p-stl..	sing..	Blng..	hand-	none..	none..	.....	cent-	Pierce...	shaft..		
Bethlehem.....B1	2½	1,775	144	Dtrt..	p-stl.	s-flx..	s....	34x4s	34x6s	wd.	N-A.-	4-4 x4½-25.5	2	ther...	Fed..	z-p-stl..	sing..	Blng..	hand-	none..	none..	.....	cent-	Pierce...	shaft..		
Blair.....C	2	2,850	144	.....	p-stl.	flex..	s....	34x4s	34x3½d	wd.	Wau.	4-4½x5½-38.9	2	cent...	Idl...	z-t-sht...	sing..	Eismn	auto	none..	none..	.....	cent-	Wau....	motor.		
Blair.....D	3	3,250	144	.....	p-stl.	flex..	s....	36x5s	36x5d	wd.	Wau.	4-4½x5½-28.9	2	cent...	Idl...	z-t-sht...	sing..	Eismn	auto	none..	none..	.....	cent-	Wau....	motor.		
Blair.....F	5	4,250	144	.....	p-stl.	flex..	s....	36x6s	36x6s	wd.	Wau.	4-4½x6½-32.4	2	cent...	Idl...	z-t-sht...	sing..	Eismn	auto	none..	none..	.....	cent-	Wau....	motor.		
Bourne.....VM	2	3,300	150	Prsh.	p-stl.	flex..	s....	36x4s	36x4d	wd.	Her..	4-4 x5½-25.6	4	cent...	G&O.	cel-cst..	sing..	Eismn	fix..	sl&i2..	Entz..	none	cent.-	Simplex	motor.		
Bourne.....XM	3½	4,000	160	Prsh.	p-stl.	flex..	s....	36x5s	36x5d	wd.	Her..	4-4½x5½-28.9	4	cent...	G&O.	cel-cst..	sing..	Eismn	fix..	sl&i2..	Entz..	none	cent.	Simplex.-	motor.		
Brinton.....H	1	1,250	125	.....	.....	.....	pnu.	33x4½s	33x4½s	wd.	Wis.	4-3½x5 -16.9	4	ther...	.....	fin-sht..	sing..	.....	fix..	ltg....	.....	.....	none	none....	none..		
Brinton.....F	2½	2,400	140	.....	.....	.....	s....	36x4*	36x6*	wd.	Con..	4-4½x5½-27.2	4	cent...	.....	fin-sht..	sing..	Bosch.	fix..	.....	.....	none	cent-	.....	motor.		
Briscoe.....24	½	725	104	own...	p-stl.	flex..	.....	31x4s	31x4s	wd.	own..	4-3⅞x5½-16.2	4	ther...	Har..	sq-t-ps..	dual.	Conn--	hand-	.....	Aut-L-	none	none	none....	none..		
Briscoe.....T-24	1	1,000	132	own...	p-stl*	s-flx..	pnu..	31x4s	34x3½s	wd.	own..	4-3⅞x5½-16.2	4	ther...	S-W.-	zz-t-ps..	sing..	Conn--	hand-	s&l2..	Aut-L-	none	none	none....	none..		
Brockway.....J3	1½	2,050	140	Prsh.	p-stl.	flex..	s....	36x3½s	36x5s	wd.	Con..	4-3½x5½-22.5	4	cent...	Bush.	fin-cst..	sing..	Bosch.	fix..	none..	none..	.....	suct.	Mnrch..	motor.		
Brockway.....K3	2	2,450	148	Prsh.	p-stl.	flex..	s....	36x4s	36x7s	wd.	Con..	4-4½x5½-27.2	4	cent...	Bush.	fin-cst..	sing.	Bosch.	fix..	none..	none..	.....	suct.	Mnrch..	motor.		
Brockway.....R	3½	3,200	164	Prsh.	p-stl.	flex..	s....	36x5s	36x5d	wd.	Con..	4-4½x5½-32.4	4	cent...	Bush.	fin-cst..	sing.	Simms	fix..	none..	none..	.....	suct.	Mnrch..	motor.		
Buick.....—	½	790	106	.....	.....	.....	.....	31x4	31x4	.....	own..	4-3½x4½-18.2	4	pump.	.....	.....	sing.	Delco.	hand-	s&l...	Delco.	.....	.....	.....	.....		
Burford.....O3	2	2,250	144*	.....	.....	.....	s....	36x3½	36x3½d	.....	Buda	4-3½x5½-22.5	4	pump.	.....	.....	sing.	Eismn	fix..	ltg....	.....	.....	none	none....	none..		
Burford.....D3	3½	3,600	175*	.....	.....	.....	s....	38x5	38x5d	.....	Wau.	4-4½x6½-32.4	4	pump.	.....	.....	sing.	Eismn	fix..	ltg....	.....	.....	cent-	Wau....	.....		
Chase.....A	1	1,725	138	.....	p-stl	s-flx..	opt..	36x3½s	36x5s	wd.	Wau.	4-3½x5½-19.6	4	cent...	Bush.	fin-sht...	sing..	Bosch.	fix..	opt...	opt.....	.....	cent-	Mnrch..	motor.		
Chase.....C	1½	2,025	149	.....	p-stl	s-flx..	s....	36x3½s	36x6s	wd.	Wau.	4-3½x5½-19.6	4	cent...	Bush.	fin-sht...	sing..	Bosch.	fix..	opt...	opt.....	.....	suct.	Mnrch..	motor.		
Chase.....B	2½	2,475	160	.....	p-stl	s-flx..	s....	36x4s	36x4d	c-s..	Bud-	4-4½x5½-27.2	4	cent...	Bush.	fin-cst..	sing..	Bosch.	fix..	opt...	opt.....	.....	suct.	Mnrch..	motor.		
Chase.....X	3	2,800	160	.....	p-stl	s-flx..	s....	36x4s	36x5d	wd.	Bud-	4-4½x5½-27.2	4	cent...	Bush.	fin-cst..	sing..	Bosch.	fix..	opt...	opt.....	.....	suct.	Mnrch..	motor.		
Chase.....O	3½	3,600	175	.....	p-stl	s-flx..	s....	36x5s	36x5d	c-s..	Con*	4-4½x5½-32.4*	2*	cent...	Bush.	fin-cst..	sing..	Bosch.	fix..	opt...	opt.....	.....	suct.	Mnrch..	motor.		
Clydesdale.....25	¼	.....	124	.....	p-stl	s-flx..	pnu..	34x4½s	34x4½s	wd.	Con..	4-3½x5 -19.6	4	ther...	own..	p-t-c-a..	sing..	Bosch.	hand-	none..	none..	.....	cent-	own....	motor.		
Clydesdale.....45	1½	.....	146	.....	p-stl	s-flx..	s....	36x3½s	36x5s	wd.	Con..	4-4½x5½-27.2	4	cent...	own..	p-t-c-a..	sing..	Bosch.	hand-	none..	none..	.....	cent-	own....	motor.		
Clydesdale.....65	2	.....	163	.....	p-stl	s-flx..	s....	36x4s	36x6s*	wd.	Con..	4-4½x5½-27.2	4	cent...	own..	p-t-c-a..	sing..	Bosch.	hand-	none..	none..	.....	cent-	own....	motor.		
Clydesdale.....90	3½	.....	180	.....	p-stl	s-flx..	s....	36x5s	36x5d	wd.	Con..	4-4½x5½-32.4	2	cent...	own..	p-t-c-a..	sing..	Bosch.	hand-	none..	none..	.....	cent-	own....	motor.		
Clydesdale.....120	5	.....	180	.....	p-stl	s-flx..	s....	36x6s	40x6d	wd.	Con..	4-4½x5½-32.4	2	cent...	own..	p-t-c-a..	sing..	Bosch.	hand-	none..	none..	.....	cent-	own....	motor.		
Collier.....M	½	900	118	Savg.	.....	.....	pnu-	32x4	32x4	.....	Lyc..	4-3½x5 -16.9	4	.....	.....	.....	.....	Conn--	hand-	.....	.....	.....	.....	.....	.....		

ABBREVIATIONS—Types of Construction

*Other Options
amid—amidships
auto—automatic
c—center
c&l—center and left
c-s—cast steel
cent—centrifugal
cel-cst—cellular core cast case
cel-sht—cellular core sheet case
cylinders cast, 2 in pairs
cylinders cast, 4 in block
cylinders cast, 3 in threes
cylinders cast, 1 singly
d—dual
d-d—dry disk
d-p—dry plate
d-rd—double reduction
elec—electric
ext-dst—external drive-shaft
ext-f-s—external front wheels.
ext-jst—external jack-shaft
ext-r-w—external rear wheel
fab—fabric
fin-sht—finned tube core sheet case
flx—fixed
flex—flexible
fric—friction
grav—gravity
gset—gearset
hyd—hydraulic
ind-c—individual clutch
int-dst—internal drive-shaft
int-f-w—internal front wheels
in-g—internal gear
in-g-4—internal gear drive on 4 wheels
int-r-w—internal rear wheel
jst—unit with jackshaft
l—left
ltg—lighting
metl—metal
mtr—unit with motor
opt—optional
plst—piston pump
plan—planetary
pnu—pneumatic
pres—pressure
prog—progressive sliding gear
p-stl—pressed steel
r—right
r-a—unit with rear axle
ring-cst—ring core cast case
rol-c—rolled channel
rol-i—rolled I-beam
r-rd—radius rods
selec—selective sliding gear
s-flx—semi-flexible
s & l—starting and lighting
s, l & i—starting, lighting and ignition
s, l & i 2—starting, lighting and ignition two-unit
sing—single
s—solid
spgs—springs
sq-t-sht—square tube core sheet case
stk—stock
sub-f—sub-frame
ther—thermo-syphon
tor-a—torque arm
tor-t—torsion tube
vacm—vacuum
wd—wood
w-d—multiple disk in oil
worm—top worm
w-p—wet plate
zz-t-sht—zig-zag tube core sheet case

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Motor in R.p.m.	Truck in M.p.h.	Carbureter, Make	Fuel Feed	Type	Make	Type	Make	Placed	Speeds	Type	Axle Make	Total Gear Reduction	Propulsion Taken By	Torque Taken By	Springs, Make	Foot	Hand	Placed	Make	Levers	Type	Make	Name and Model
.....	.....	Schblr..	grav..	none..	none...	elec....	none...	amid..	2	in-g...	own....	.....	r-rd....	r-rd....	Perf...	ext-r-w.	ext-f-w.	r....	Gem..	r....	metl..	Franck.	A. & B.....3T
.....	.....	Schblr..	grav..	none..	none...	elec....	none...	amid..	2	in-g...	own....	.....	r-rd....	r-rd....	Perf...	ext-r-w.	ext-f-w.	r....	Gem..	r....	metl..	Franck.	A. & B.....5T
1,500	18	Stmbg..	vacm..	d-p...	B-Beck.	selec...	Covert.	mtr...	3	worm.	Timkn.	7.75	spgs...	spgs...	Dtrt...	int-r-w.	int-r-w.	r....	Ross..	c....	metl..	Blood..	Acason.....B
1,200	15	Schblr..	vacm..	d-d...	Muncie	selec...	Muncie	mtr...	4	worm.	Timkn.	7.75	spgs...	spgs...	Dtrt...	int-r-w.	int-r-w.	r....	Ross..	c....	metl..	Blood..	Acason.....H
1,200	12	Schblr..	vacm..	d-d...	Muncie	selec...	Muncie	mtr...	4	worm.	Timkn.	10.3	spgs...	spgs...	Dtrt...	int-r-w.	int.....	r....	Ross..	c....	metl..	Blood..	Acason.....L
1,000	10	Stmbg..	vacm..	d-p...	B-Beck.	selec...	Cotta..	mtr...	3	worm.	Timkn	11.6	spgs...	spgs...	Dtrt...	int-r-w.	int-r-w.	r....	Ross..	c....	metl..	Blood..	Acason.....M
1,200	15	Schblr..	vacm..	d-d...	Muncie	selec...	Muncie	mtr...	4	worm.	Timkn.	9.25	spgs...	spgs...	Dtrt...	int-r-w.	int-r-w.	r....	Ross..	c....	metl..	Blood..	Acason.....Tractor
1,000	10	Stmbg..	vacm..	d-p...	B-Beck.	selec...	Cotta..	mtr...	3	worm.	Timkn.	10.3	spgs...	spgs...	Dtrt...	int-r-w.	int-r-w.	r....	Ross..	c....	metl..	Blood..	Acason.....Tractor
1,700	22	Rayfld.	vacm..	d-p...	B-Beck.	mesh...	Cotta..	mtr...	3	worm.	Timkn.	7.75	spgs...	spgs...	Dtrt...	int-r-w.	int-r-w.	l....	Ross..	c....	.....	.....	Acme.....B
1,300	17	Rayfld.	vacm..	d-p...	B-Beck.	mesh...	Cotta..	mtr...	3	worm.	Timkn.	9.25	spgs...	spgs...	Dtrt...	int-r-w.	int-r-w.	l....	Ross..	c....	.....	.....	Acme.....A
1,200	14	Rayfld.	vacm..	d-p...	B-Beck.	.....	Cotta..	amid..	3	worm.	Timkn.	12.00	r-rd....	spgs...	Dtrt...	int-r-w.	int-r-w.	l....	Ross..	c....	.....	.....	Acme.....C
1,143	14	Stmbg..	grav..	d-p...	Detlaf..	selec...	Covert.	amid..	4	worm.	Shel...	8.75	spgs...	spgs...	Perf...	int-r-w.	int-r-w.	l....	Lavn..	c....	metl..	M-Eva.	American.....30
1,200	15	Schblr..	grav..	d-p...	B-Beck.	selec...	Covert.	mtr...	3	worm.	Timkn.	8.50	r-rd....	spgs...	Mthr...	int-r-w.	int-r-w.	l....	Ross..	c....	metl..	Spicer.	Armleder.....HW
1,000	12	Schblr..	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	3	worm.	Timkn.	8.75	r-rd....	spgs...	Mthr...	int-r-w.	ext-d-s.	l....	Gem..	c....	metl..	Spicer.	Armleder.....KW
600	.....	Carter..	.....	.....	B-Beck.	selec...	.....	mtr...	3	bevl...	Hess...	4.75	spgs...	spgs...	.....	ext-r-w.	int-r-w.	.....	Lavn..	. ..	metl..	Arvac..	Atlas.....18
1,200	15	Zenith..	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	4	worm.	Timkn.	8.5	spgs...	spgs...	.....	int-r-w.	int-r-w.	r....	Gem..	r....	.....	.....	Atterbury.....7R
1,200	15	Zenith..	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	4	worm.	Timkn.	8.5	spgs...	spgs...	.....	int-r-w.	int-r-w.	r....	Gem..	r....	.....	.....	Atterbury.....7C
1,125	13	Zenith..	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	4	worm.	Timkn.	10.3	spgs...	spgs...	.....	int-r-w.	int-r-w.	r....	Gem..	r....	.....	.....	Atterbury.....7D
.....	.....	Stmbg..	grav..	d-p...	own....	prog...	own...	amid..	3	d-rd...	own....	7.15	spgs...	spgs...	.....	int-r-w.	ext-r-w.	r....	own..	r....	.....	.....	Autocar.....XXI-F
.....	.....	Stmbg..	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	3	worm.	Timkn.	7.00	r-rd....	spgs...	Tut....	int-r-w.	int-r-w.	l....	Ross..	c....	.....	.....	Available.....1
.....	.....	Stmbg..	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	3	worm.	Timkn.	7.75	r-rd....	spgs...	Tut....	int-r-w.	int-r-w.	l....	Ross..	c....	.....	.....	Available.....2
1,214	14	Stmbg..	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	3	worm.	Timkn.	10.30	r-rd....	spgs...	Tut....	int-r-w.	int-r-w.	l....	Ross..	c....	.....	.....	Available.....3
1,175	12	Stmbg..	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	3	worm.	Timkn.	11.7	r-rd....	spgs...	Tut....	int-r-w.	int-r-w.	l....	Ross..	c....	.....	.....	Available.....5
1,200	14½	Rayfld.	.....	d-d...	.....	selec...	.....	jst....	3	chn...	.....	3.5	r-rd....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Avery.....B
1,200	13	Rayfld.	.....	d-p...	.....	selec...	.....	jst....	3	chn...	.....	3.5	r-rd....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Avery.....B
1,200	12	Rayfld.	.....	d-d...	.....	selec...	.....	jst....	3	chn...	.....	3.5	r-rd....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Avery.....A
.....	.....	Stmbg..	grav..	d-p...	own....	selec...	Fuller.	mtr...	3	worm.	own....	.....	spgs...	spgs...	own....	int-r-w.	ext-r-w.	l....	Ross..	c....	.....	.....	Barber Tractor.....3
2,000	18	Stmbg--	grav..	d-d...	Fuller.	selec...	Fuller.	mtr...	3	in-g...	Clark..	.....	.....	.....	Hig....	ext-r-w.	int-r-w.	l....	Lavn..	c....	metl..	Blood..	Beck.....A
2,000	18	Stmbg--	grav..	d-d...	Fuller.	selec...	Fuller.	.....	3	in-g...	Clark..	6.00	.....	.....	Hig....	ext-r-w.	int-r-w.	l....	Lavn..	c....	metl..	Blood..	Beck.....B
1,500	12	Stmbg--	grav..	d-d...	Fuller.	selec...	Fuller.	mtr...	3	in-g...	Clark..	9.00	.....	.....	Hig....	ext-r-w.	in-tr-w.	l....	Lavn..	c....	metl..	Blood..	Beck.....C
1,000	12	King....	.....	d-p...	B-Beck.	selec...	own....	amid..	6	bevl...	own....	8.0	r-rd....	spgs...	.....	ext-r-w.	ext-sht.	.....	own....	.....	metl..	.....	Beech Creek.....3A
..-....	.....	Zenith--	grav..	d-d...	Fuller.	selec...	Fuller.	mtr...	3	in-g...	Torb...	7.0	spgs...	spgs...	Perf...	ext-r-w.	int-r-w.	l....	Ross..	r ..	metl..	Blood..	Bessemer.....G
1,100	15	Rayfld.	grav..	cone..	Hartfd.	selec...	B-Lipe.	amid..	3	worm.	Timkn.	8.0	spgs...	spgs...	Perf...	int-r-w.	ext-....	l....	Ross..	r....	metl..	Spicer.	Bessemer.....D
1,100	15	Rayfld.	grav..	cone..	Hartfd.	selec...	B-Lipe.	amid..	3	in-g...	Torb...	8.0	r-rd....	spgs...	Perf...	ext-r-w.	int-f-w.	l....	Ross..	r....	metl..	Blood..	Bessemer.....J
1,160	12	Rayfld.	grav..	cone..	Hartfd.	selec...	B-Lipe.	amid..	3	worm.	Timkn.	10.3	r-rd....	spgs...	Perf...	int-r-w.	ext-r-w.	l....	Ross..	r....	metl..	Spicer.	Bessemer.....E
1,300	18	Schblr..	grav..	d-p...	GBS....	selec...	Dtrt...	mtr...	3	in-g...	Russl..	7.4	spgs...	spgs...	Shel...	ext-r-w.	int-r-w.	l....	Lavn..	c....	metl..	Univ...	Bethlehem.....A1
1,230	15	Schblr..	grav..	d-d...	Dtrt...	selec...	Dtrt...	mtr...	3	in-g...	Russl..	8.3	spgs...	spgs...	Shel...	ext-r-w.	int-r-w.	l....	Lavn..	c....	metl..	Univ...	Bethelehem.....B1
1,060	14	Zenith--	grav..	cone..	own....	mesh..	Cotta..	amid..	3	worm.	Key-H.	7.67	r-rd....	s-fr....	Shel...	int-r-w.	ext-d-s.	r....	Lavn..	r....	.....	.....	Blair.....C
1,000	12	Zenith--	grav..	cone..	own....	mesh..	Cotta..	amid..	3	worm.	Key-H.	8.67	r-rd....	s-fr....	Shel...	int-r-w.	ext-d-s.	r....	Lavn..	r....	.....	.....	Blair.....D
900	10	Zenith--	grav..	cone..	own....	mesh..	Cotta..	amid..	3	worm.	Key-H.	9.33	r-rd....	s-fr....	Shel...	int-r-w.	ext-....	r....	Lavn..	r....	.....	.....	Blair.....F
1,400	15	Zenith--	grav..	elec....	.....	elec....	.....	elec....	.....	worm.	Timkn.	.....	r-rd....	spgs...	Mthr...	int-r-w.	int-r-w.	l....	own...	l....	metl..	Blood..	Bourne.....VM
1,350	12	Zenith--	grav..	elec....	.....	elec....	.....	elec....	.....	worm.	Timkn.	.....	r-rd....	spgs...	Mthr...	int-r-w.	int-r-w.	l....	Ross..	l....	metl	Blood..	Bourne.....XM
..-....	.....	.....	pres..	d-d...	.....	selec...	.....	mtr...	3	worm.	.....	6.2	spgs...	spgs...	.....	int-r-w.	int-f-w.	l....	.....	c....	.....	.....	Brinton.....H
..-....	.....	.....	grav..	d-d...	.....	selec...	.....	mtr...	3	worm.	.....	7.75	spgs...	spgs...	.....	int-r-w.	int-r-w.	l....	.....	c....	.....	.....	Brinton.....A
..-....	.....	Buick..	grav..	cone..	own....	selec...	own....	r-ax...	3	bev...	own....	4.25	tor-a...	tor-a...	.....	int-r-w.	ext-r-w.	l....	own..	r....	metl..	own....	Briscoe.....24
..-....	.....	Buick..	grav..	cone..	own....	selec...	own....	j-st...	3	chn...	own....	9.0	r-rd....	.....	.....	int-r-w.	ext-j-s.	l....	own..	c....	metl..	own....	Briscoe.....T-24
1,200	15	Schcblr.	grav..	cone..	Hart....	selec...	B-Lipe.	amid..	3	worm.	Shel...	8.66	spgs...	spgs...	Merl...	int-r-w.	int-r-w.	l....	Lavn..	c....	metl..	Spicer.	Brockway.....J3
1,200	15	Schblr..	grav..	cone..	Hart....	selec...	B-Lipe.	amid..	3	worm.	Timkn.	8.5	r-rd....	spgs...	Merl...	int-r-w.	int-r-w.	l....	Lavn..	c....	metl..	Spicer.	Brockway.....K3
1,100	12	Schblr..	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	3	worm.	Timkn.	10.5	r-rd....	spgs...	Merl...	int-r-w.	int-r-w.	l....	Lavn..	c....	metl..	Spicer.	Brockway.....R
.....	.....	Marvel.	vacm..	d-d...	own....	selec...	own....	mtr...	.....	bevl...	Timkn.	4.0	.....	.....	.....	int-r-w.	ext-r-w.	.....	.....	.....	.....	.....	Buick.....
1,200	15	Zenith..	grav..	cone..	Warner	selec...	Warner	mtr...	3	in-g...	own....	8.5	spgs...	spgs...	.....	exts-ht.	ext-r-w.	.....	Ross..	.....	.....	.....	Burford.....O3
1,000	13	Zenith..	vacm..	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Shel...	13.1	r-rd....	spgs...	.....	int-f-w.	int-r-w.	.....	Ross..	.....	.....	.....	Burford.....D3
1,200	18	Stmbg..	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	3	worm.	Shel...	7.8	spgs...	spgs...	Perf...	int-r-w.	int-r-w.	l....	Lavn..	c....	.....	.....	Chase.....A
1,000	16	Stmbg..	grav..	d-p...	B-Beck.	selec...	Cotta..	mtr...	3	worm.	Shel...	8.66	spgs...	spgs...	Perf...	int-r-w.	ext-r-w.	l....	Lavn..	c....	.....	.....	Chase.....C
1,000	14	Stmbg..	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	3	worm.	Shel...	8.66	spgs...	spgs...	Perf...	int-r-w.	ext-r-w.	l....	Lavn..	c....	.....	.....	Chase.....B
1,000	12	Stmbg..	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	4	worm.	Shel...	9.25	spgs...	spgs...	Perf...	int-r-w.	int-r-w.	l....	Lavn..	c....	.....	.....	Chase.....X
1,000	12	Stmbg..	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	4	worm.	Shel...	8.75	spgs...	spgs...	Perf...	ext-r-w.	ext-r-w.	l....	Lavn..	c....	.....	.....	Chase.....O
.....	.....	Zenith..	grav..	cone..	Dtrt....	selec...	Dtrt...	mtr...	3	bevl...	Slsby...	5.83	spgs...	tor-a...	Hess...	int-r-w.	ext-r-w.	r....	Ross..	c....	.....	.....	Clydesdale.....25
1,120	15	Zenith..	grav..	disk...	B-Lipe.	selec...	B-Lipe.	mtr...	4	worm.	Timkn.	7.75	spgs...	spgs...	Perf...	int-r-w.	int-r-w.	r....	Ross..	c....	.....	.....	Clydesdale.....45
1,115	14	Zenith..	grav..	disk...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	8.5	r-rd....	spgs...	Perf...	int-r-w.	int-r-w.	r....	Ross..	r....	.....	.....	Clydesdale.....65
1,175	12	Zenith..	grav..	disk...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	10.3	r-rd....	spgs...	Perf...	int-r-w.	int-r-w.	r....	Ross..	r....	.....	.....	Clydesdale.....90
1,160	10	Zenith..	grav..	disk...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	13.66	r-rd....	spgs...	Perf...	int-r-w.	int-r-w.	r....	Ross..	r....	.....	.....	Clydesdale.....120
.....	35	Zenith..	grav..	d-p...	Mech..	selec...	.....	mtr...	3	bevl...	Slsby...	6.0	spgs...	tor-a...	.....	int-r-w.	ext-r-w.	.....	own..	.....	fab....	Norwk.	Collier.....M

ABBREVIATIONS—Makers of Parts

*Other Options

A-K—Atwater-Kent
Aut-L—Auto-Lite
B-Beck—Borg & Beck
B-Lipe—Brown-Lipe
Blng—Berling
Brm—Bremer
Bud—Buda
Can—Candler
Celfr—Celfor
Chgo—Chicago
Con—Continental
Conn—Connecticut
Dtrt—Detroit
Dynt—Dyneto
Elsmn—Elsemann
E-M—English & Mersick
Eur—Eureka
Fed—Fedders
Franck—Francke
G&O—G & O Mfg. Co.
GBS—Golden, Belknap & Swartz
G-C—Garden City
Gem—Gemmer
Har—Harrison
Hart—Hartford
Hays—Hayes
Hig—Higgins
H-Shaw—Hele-Shaw
H-S—Herschell-Spillman
Idl—Ideal
Iron—Iron City
Jacx—Jackson-Church-Wilcox
Jhnson—Johnson
Kal—Kalamazoo
K-B—Kinsler-Bennett
Key-H—Keystone-Hindley
Lavn—Lavigne
LeR—LeRoi
Lgt—Light
Ligt—Liggett
Lyc—Lycoming
M'C—McCord
Merl—Merrill
Mil—Milwaukee
Murch—Monarch
Mthr—Mather
Natl—National
N. A.—North American
P & B—Parish & Bingham
Perf—Perfection
Prsh—Parish
R-T—Rome-Turney
Rayfld—Rayfield
Rowl—Wm. Harvey Rowland
Russl—Russel
Rut—Rutenber
Salsby—Salisbury
S-A—Savage Arms
Schblr—Schebler
Shel—Sheldon
Shkspr—Shakespeare
Smth—A. O. Smith
S-P—Spring-Perch
Spltf—Splitdorf
Stewrt—Stewart
Stmbg—Stromberg
Sundmn—Sunderman
S-W—Sparks-Withington
Ther—Thermoid
Timkn—Timken
Torb—Torbenson
Tut—Tuthill
Univ—Universal Machine Co.
Wau—Waukesha
Wilcx—Wilcox
Wis—Wisconsin

Prices are exclusive of the 3 per cent Government war tax

Technical Specifications of Gasoline

Name and Model	Tons Capacity	Chassis Price	Wheelbase, Inches	FRAME			TIRES			Wheels	ENGINE															
								Sizes in Ins.						COOLING			IGNITION			ELEC. SYSTEM			GOVERNOR		
				Make	Material	Type	Kind	Front	Rear		Make	No. Cyl. Bore and Stroke—N.A.C.C., Hp.	Cylinders Cast	Water Circ.	Radiator Make	Radiator Core and Case	Type	Make	Spark Advance	Type	Make	Extra Cost	Type	Make	Drive
Columbia E-T	2	1,950	144	.....	rol-c	flex.	s....	36x4s	36x6s	wd.	Bud*	4-4¼x5½-27.2	4	cent.	Long.	fin-cst.	sing.	Eismn	hand.	ltg.	Vesta.	75	suct.	Mnrch.	motor.
Commerce E	1	1,340	126	Dtrt.	p-stl	flex.	s....	34x4s	34x4s	wd.	Buff.	4-3½x5 -19.6	4	ther.	Long.	fin-cst.	sing.	Remy.	hand.	sl&i2.	Remy.	none	cent.	Pierce.	shaft.
Concord B	1	1,750	130	.....	p-stl	flex.	opt.	36x5s	36x5s	wd.	Bud.	4-3½x5½-19.6	4	ther.	Bush.	fin-cst.	sing.	Eismn	fix.	s&l.	West.	150	none	none	none.
Concord A	2	2,400	145	.....	p-stl	s-flx.	s....	36x4s	36x4d	wd.	Bud.	4-4¼x5½-28.9	4	cent.	Bush.	fin-cst.	sing.	Eismn	fix.	s&l.	West.	150	cent.	Pierce.	motor.
Continental FL	1	1,750	144	.....	.....	.....	s....	34x3	36x4	.....	.....	4-3½x5½-22.5	2	.....	.....	.....	sing.	Bsch*	fix.	.....	.....	.....	suct.	.....	motor.
Continental HL	1½	2,100	144	.....	.....	.....	s....	34x3½	36x5	.....	.....	4-3½x5½-22.5	2	.....	.....	.....	sing.	Bsch*	fix.	.....	.....	.....	suct.	.....	motor.
Continental J	2	2,300	146	.....	.....	.....	s....	36x4	36x4d	.....	.....	4-4¼x5½-27.2	2	.....	.....	.....	sing.	Bsch*	fix.	.....	.....	.....	suct.	.....	motor.
Continental M	3½	3,300	168*	.....	.....	.....	s....	36x5	36x5d	.....	.....	4-4¼x5½-32.4	2	.....	.....	.....	sing.	Bsch*	fix.	.....	.....	.....	suct.	.....	motor.
Corbitt E	1	1,650	130	.....	p-stl	flex.	opt.	34x3½s	34x4s	wd.	Con.	4-3½x5 -22.5	4	ther.	Idl.	cel-sht.	sing.	Eismn	hand.	sl&i2.	Disco	100	cent.	Pierce.	motor.
Corbitt D	1½	1,900	138	.....	p-stl	flex.	opt.	36x3½s	36x5s	wd.	Con.	4-3½x5 -22.5	4	ther.	Idl.	cel-sht.	sing.	Eismn	hand.	sl&i2.	Disco	100	cent.	Pierce.	motor.
Corbitt C	2	2,650	148	.....	p-stl	flex.	s....	36x4s	36x7s	wd.	Con.	4-4½x5½-27.2	4	cent.	R-T.	fin-cst.	sing.	Eismn	hand.	none.	none.	.....	cent.	Pierce.	motor.
Corbitt B	2½	2,900	148	.....	p-stl	flex.	s....	36x4s	36x7s	wd.	Con.	4-4½x5½-27.2	4	cent.	R-T.	fin-cst.	sing.	Eismn	hand.	none.	none.	.....	cent.	Pierce.	motor.
Corbitt A	3½	3,800	168	.....	rol-c	rigid.	s....	36x5s	36x5d	wd.	Con.	4-4½x5½-32.4	2	cent.	R-T.	fin-cst.	sing.	Eismn	hand.	none.	none.	.....	cent.	Pierce.	motor.
Corbitt AA	5	4,200	168	.....	rol-c	rigid.	s....	36x6s	40x6d	c-s.	Con.	4-4½x6 -32.4	2	cent.	R-T.	fin-cst.	sing.	Eismn	hand.	none.	none.	.....	cent.	Pierce.	motor.
Corliss A	½	800*	100	.....	.....	.....	pnu.	31x4	31x4	.....	.....	4-3½x4½-15.6	4	.....	.....	.....	sing.	Spltf.	hand.	.....	.....	.....	.....	.....	.....
Couple-Gear HC	3½	5,600	144*	own.	.....	.....	s....	36x4d	36x4d	.....	Wis.	4-5½x7 -53.0	1	ther.	.....	.....	.....	Eismn	.....	ltg.	.....	.....	.....	Wis.	.....
Couple-Gear AC	5	6,400	144*	own.	.....	.....	s....	36x5d	36x5d	.....	Wis.	4-5½x7 -53.0	1	ther.	.....	.....	.....	Eismn	.....	ltg.	.....	.....	cent.	Wis.	f-whl.
Croce 17	½	825	108	.....	.....	.....	s*..	32x4	32x4	.....	Wis.	4-3½x5 -16.9	4	.....	.....	.....	.....	Bosch.	fix.	.....	.....	.....	.....	.....	.....
Dart E	1	1,800	130	Savg.	.....	.....	s....	34x3½	34x5	.....	Bud.	4-3½x5½-22.5	4	.....	.....	.....	.....	Eismn	fix.	.....	.....	.....	.....	.....	.....
Dart C-C4	2	2,470	150	Savg.	.....	.....	s....	36x4	36x7	.....	Bud.	4-4¼x5½-28.9	4	.....	.....	.....	.....	Eismn	fix.	.....	.....	.....	cent.	Simplex	motor.
Dart L	3½	3,400	160	Savg.	.....	.....	s....	36x5	36x10	.....	Bud.	4-4½x6 -32.4	4	.....	.....	.....	.....	Eismn	hand.	.....	.....	.....	cent.	Simplex	motor.
Dayton H	2	2,650	.....	.....	.....	.....	s....	36x4	36x3½d	.....	Wis.	4-4¼x5 -21.0	2	.....	.....	.....	.....	Bosch	hand.	.....	.....	.....	.....	.....	.....
Dayton J	3½	3,400	.....	.....	.....	.....	s....	36x5	36x4d	.....	Wis.	4-4¼x6 -29.0	4	.....	.....	.....	.....	Bosch.	hand.	.....	.....	.....	.....	.....	.....
Dayton K	3½	3,400	.....	.....	.....	.....	s....	36x5	36x4d	.....	Wis.	4-4½x5½-36.1	2	.....	.....	.....	.....	Bosch.	hand.	.....	.....	.....	.....	.....	.....
Dayton M	5	4,500	.....	.....	.....	.....	s....	36x6	42x5d	.....	Wis.	4-5½x7 -44.2	2	.....	.....	.....	.....	Bosch.	hand.	.....	.....	.....	.....	.....	.....
Dayton E	7½	4,950	.....	.....	.....	.....	s....	36x7	42x6d	.....	Wis.	4-5½x7 -44.2	2	.....	.....	.....	.....	Bosch.	hand.	.....	.....	.....	.....	.....	.....
D-E J	¾	950	108	Savg.	p-stl.	s-flx.	pnu.	33x4s	33x4s	wd.	L-R.	4-3½x4½-15.6	4	ther.	Bush.	fin-sht.	sing.	Brlng.	hand.	s&l.	Al-Ch.	none	none	none	.....
D-E A	1½	1,495	128	Savg.	p-stl.	s-flx.	s....	34x3s	34x4s	wd.	Con.	4-3½x5 -19.6	4	ther.	Bush.	fin-cst.	sing.	Brlng.	fix.	none.	none.	.....	.....	none	.....
D-E B	2	1,755	144	Savg.	p-stl.	s-flx.	s....	34x3½s	34x5s	wd.	Con.	4-3½x5 -22.5	4	ther.	Bush.	fin-cst.	sing.	Brlng.	fix.	none.	none.	.....	.....	none	.....
D-E C	3	2,365	150	Savg.	p-stl.	s-flx.	s....	36x4s	36x7s	wd.	Bud.	4-4¼x5½-28.9	4	ther.	Bush.	fin-cst.	sing.	Brlng.	fix.	none.	none.	.....	.....	none	.....
DeKalb E	2	2,100	134	.....	p-stl.	flex.	s....	34x3½s	36x5s	wd.	Con.	4-4½x5½-27.2	4	cent.	Bush.	cel-p-s.	sing.	Eismn	hand.	none.	none.	.....	cent.	Pierce.	motor.
DeKalb E	2½	2,450	136	.....	p-stl.	flex.	s....	36x4s	36x6s	wd.	Con.	4-4½x5½-27.2	4	cent.	Bush.	cel-p-s.	sing.	Eismn	fix.	none.	none.	.....	cent.	Pierce.	motor.
Denby 12	1	1,490	124	.....	.....	.....	s....	34x3	34x4	.....	Con.	4-3½x5 -19.6	4	.....	.....	.....	sing.	Eismn	fix.	s&l.	Bijur.	.....	cent.	Mnrch.	motor.
Denby 13	2	2,025	144	.....	.....	.....	s....	36x3½	36x6	.....	Con.	4-3½x5 -22.5	4	.....	.....	.....	sing.	Eismn	fix.	s&l.	Bijur.	.....	cent.	Mnrch.	motor.
Denby 15	3	2,525	144	.....	.....	.....	s....	36x4	36x4d	.....	Con.	4-3½x5 -22.5	4	.....	.....	.....	sing.	Eismn	fix.	s&l.	Bijur.	.....	cent.	Mnrch.	motor.
Denmo 12	¾	960	115	.....	.....	.....	pnu.	32x4	32x4	.....	H-S.	4-3½x5 -16.9	4	.....	.....	.....	sing.	Spltf.	.....	s&l.	Bijur.	.....	.....	.....	d-e ft.
Denmo 10	1¼	1,490	124	.....	.....	.....	s*..	34x4½	34x4	.....	.....	4-3½x5 -22.5	4	.....	.....	.....	sing.	Spltf.	.....	stg.	Spltf.	.....	cent.	Pierce.	.....
Diamond-T J5	1	1,725	132	.....	.....	.....	s....	36x3	36x4	.....	Con.	4-3½x5 -19.6	4	.....	.....	.....	sing.	Bosch.	fix.	.....	.....	.....	.....	.....	.....
Diamond-T J4	1½	2,200	154*	.....	.....	.....	s....	36x3½	36x5	.....	Con.	4-3½x5 -22.5	4	.....	.....	.....	sing.	Bosch.	fix.	.....	.....	.....	.....	.....	.....
Diamond-T J3	2	2,475	154*	.....	.....	.....	s....	36x4	36x6	.....	Con.	4-4¼x5½-27.2	4	.....	.....	.....	sing.	Bosch.	fix.	.....	.....	.....	cent.	Pierce.	motor.
Diamond-T L	3½	3,750	170*	.....	.....	.....	s....	36x5	36x5d	.....	Con.	4-4¼x5½-32.4	2	.....	.....	.....	sing.	Bosch.	hand.	.....	.....	.....	suct.	Mnrch.	motor.
Diamond-T R	5	4,600	170*	.....	.....	.....	s....	36x6	40x6d	.....	Con.	4-4¼x5½-32.4	2	.....	.....	.....	sing.	Bosch.	hand.	.....	.....	.....	suct.	Mnrch.	motor.
Dispatch ¾	¾	1,100	120	own.	.....	.....	pnu.	34x4s	34x4s	wd.	Wis.	4-3½x5 -22.5	4	ther.	Amer	cel-sht.	sing.	Delco	hand.	sl&i.	USL.	none	none	none	none
Doane	2½	3,000	150	.....	.....	.....	s....	36x4	36x7	.....	.....	4-4¼x5½-29.0	2	.....	.....	.....	sing.	Bosch.	auto	.....	.....	.....	.....	Wau	.....
Doane	6	4,750	178	.....	.....	.....	s....	36x6	38x6d	.....	.....	4-4¼x6½-36.1	2	.....	.....	.....	sing.	Bosch.	auto	.....	.....	.....	cent.	Wau	motor.
Dorris I-B-W	2	2,285	144	.....	.....	.....	s....	36x4	36x4d	.....	own.	4-4¼x5 -30.7	2	.....	.....	.....	sing.	Bosch.	hand.	.....	.....	.....	cent.	Pierce.	motor.
Duplex D	3½	3,600	130*	.....	.....	.....	s....	36x6	36x6	.....	Bud.	4-4½x5½-29.0	4	.....	.....	.....	sing.	Eism*	hand.	s&l.	.....	.....	.....	.....	.....
Ellsworth 25A	½	.....	108	p&b.	p-stl.	flex.	pnu.	30x3½s	30x3½s	wd.	Lyc.	4-3½x5 -16.9	4	ther.	Can.	cel.	sing.	hand.	sli2.	.....	.....	.....	none	none	none
Fageol 2	2	2,750	144	.....	rol-c	.....	s....	34x4s	36x7s	wd*	Wau	4-4 x5½-25.6	2	cent.	Per.	cel-cst.	sing.	Eismn	fix.	.....	.....	.....	cent.	Wau	motor.
Fargo P	2	2,200	146	own.	rol-c	s-flx.	s....	36x4s	36x6s	wd.	own.	4-3½x5 -22.5	4	ther.	own.	fin-cst.	sing.	Dixie.	hand.	sli2.	West.	150	suct.	Mnrch.	motor.
Federal S	1	1,750	132	own.	.....	.....	s....	34x3	34x4	.....	own.	4-3½x5½-19.6	4	.....	.....	.....	sing.	Eismn	fix.	s&l.	.....	.....	cent.	Smplex.	motor.
Federal T	1½	2,200	144	own.	.....	.....	s....	36x3½	36x5	.....	own.	4-3½x5½-22.5	4	.....	.....	.....	sing.	Eismn	fix.	s&l.	Wstg.	.....	cent.	Snplex.	motor.
Federal U	2	2,450	144	own.	.....	.....	s....	36x4	36x7*	.....	own.	4-4½x5½-22.5	4	.....	.....	.....	sing.	Eismn	fix.	s&l.	Wstg.	.....	cent.	own	motor.
Federal W	3½	3,150	156	own.	.....	.....	s....	36x5	36x5d	.....	own.	4-4½x5½-29.0	4	.....	.....	.....	sing.	Eismn	fix.	ltg.	Wstg.	.....	cent.	own	motor.
Federal X	5	4,200	156	own.	.....	.....	s....	36x6	40x6d*	.....	own.	4-4½x5½-29.0	4	.....	.....	.....	sing.	Eismn	fix.	s&l.	.....	.....	cent.	Simplex	motor.
Forschler AO	1	1,815	138	.....	rol-c	flex.	s....	34x3s	34x4s	wd.	Con.	4-3½x5 -19.6	4	cent.	E-M.	sq-t-sht.	sing.	Bosch.	fix.	.....	.....	.....	cent.	Mnrch.	motor.
Forschler BO	2	2,475	138	.....	rol-c	flex.	s....	34x4s	34x6s	wd.	Con.	4-4½x5½-27.2	4	cent.	E-M.	sq-t-sht.	sing.	Bosch.	fix.	.....	.....	.....	cent.	Mnrch.	motor.
Ford 1	1	600	123	.....	p-stl	.....	s....	30x3s	32x3s	wd.	own.	4-3½x4 -22.5	4	ther.	own.	fin-s-s.	sing.	own.	hand.	ltg.	own.	.....	none	none	.....
F. W. D B	3	4,000	124	Prsh.	.....	.....	s....	36x6	36x6	.....	Wis.	4-4½x5½-36.1	2	ther.	.....	.....	sing.	Eismn	hand.	s&l.	N-E.	.....	.....	.....	motor.
Fulton F-2	1½	1,420	136	.....	p-stl.	s-flx.	s....	34x3½s	34x5s	wd.	own.	4-3½x5 -19.6	4	ther.	own.	sq-t-c-i.	sing.	Spltf.	hand.	opt.	.....	.....	suct.	Mnrch.	motor.
Garford 75B	1	1,750	128	own.	.....	.....	s*..	34x4½	36x4	.....	Bud.	4-3½x5½-19.6	4	ther.	.....	.....	sing.	Spltf.	hand.	s&l.	Wstg.	.....	suct.	Mnrch.	motor.
Garford 66B	1½	2,100	142*	own.	.....	.....	s....	36x3½	36x5	.....	Bud.	4-3½x5½-22.5	4	pump.	.....	.....	sing.	Spltf.	hand.	s&l.	Westg.	.....	suct.	Mnrch.	motor.
Garford 70B	2	2,600	142*	own.	.....	.....	s....	36x4	36x4d	.....	Bud.	4-4¼x5½-29.0	4	pump.	.....	.....	sing.	Bosch.	hand.	s&l.	Wstg.	.....	suct.	Mnrch.	motor.
Garford 77B	3½	3,700	128*	own.	.....	.....	s....	36x5	40x5d	.....	Wis.	4-4¼x6 -28.0	4	pump.	.....	.....	sing.	Bosch.	hand.	s&l.	Wstg.	.....	cent.	own	motor.
Garford 68	5	4,500	128*	own.	.....	.....	s....	36x6	40x6d	.....	Wis.	4-4½x5½-36.1	2	pump.	.....	.....	sing.	Bosch.	hand.	.....	Wstg.	.....	suct.	own	motor.
Garford 69	6	4,700	128*	own.	.....	.....	s....	36x6	40x7d	.....	Wis.	4-5½ox5½-41.6	2	pump.	.....	.....	sing.	Bosch.	hand.	.....	Wstg.	.....	suct.	own	motor.
Garford Tractor	4½	2,700	116	own.	.....	.....	.....	36x4	36x4d	.....	Bud.	4-4¼x5½-29.0	4	pump.	.....	.....	sing.	Bosch.	hand.	.....	Wstg.	.....	.....	Mnrch.	.....
Garford Tractor	7½	3,800	105	own.	.....	.....	.....	36x5	40x5d	.....	Wis.	4-4¼x5½-36.1	2	pump.	.....	.....	sing.	Bosch.	hand.	.....	Wstg.	.....	.....	own	.....
Garford Tractor	10	4,600	102	own.	.....	.....	.....	36x6	40x6d	.....	Wis.	4-4½ox5½-41.5	2	pump.	.....	.....	sing.	Bosch.	hand.	.....	Wstg.	.....	.....	own	.....
Gary F	1	.....	130	P&B.	p-stl.	flex.	s....	36x3½s	36x4s	wd.	Bud*	4-3½x5½-22.5	4	ther.	Chgo	zz-t-ps.	sing.	Eismn	fix.	.....	opt.	Vesta.	.....	suct.	Mnrch.	motor.
Gary G	1½	.....	144	P&B.	p-stl.	flex.	s....	36x3½s	36x5s	wd.	Bud.	4-4¼x5½-28.9	4	cent.	Chgo	zz-t-ps.	sing.	Eismn	fix.	.....	opt.	Vesta.	.....	cent.	Simplex	motor.

ABBREVIATIONS—Types of Construction

*Other Options
amid—amidships
auto—automatic
c—center
c&l—center and left
c-s—cast steel
cent—centrifugal
cel-cst—cellular core cast case
cel-sht—cellular core sheet case
cylinders cast, 2 in pairs
cylinders cast, 4 in block
cylinders cast, 3 in threes
cylinders cast, 1 singly
d—dual
d-d—dry disk
d-p—dry plate
d-rd—double reduction
elec—electric
ext-dst—external drive-shaft
ext-f-s—external front wheels.
ext-jst—external jack-shaft
ext-r-w—external rear wheel
fab—fabric
fin-sht—finned tube core sheet case
fix—fixed
flex—flexible
fric—friction
grav—gravity
gset—gearset
hyd—hydraulic
ind-c—individual clutch
int-dst—internal drive-shaft
int-f-w—internal front wheels
in-g—internal gear
in-g-4—internal gear drive on 4 wheels
int-r-w—internal rear wheel
jst—unit with jackshaft
l—left
ltg—lighting
mtl—metal
mtr—unit with motor
opt—optional
pist—piston pump
plan—planetary
pnu—pneumatic
pres—pressure
prog—progressive sliding gear
p-stl—pressed steel
r—right
r-a—unit with rear axle
ring-cst—ring core cast case
rol-c—rolled channel
rol-i—rolled I-beam
r-rd—radius rods
selec—selective sliding gear
s-flx—semi-flexible
s & l—starting and lighting
s, l & i—starting, lighting and ignition
s, l & i 2—starting, lighting and ignition two-unit
sing—single
s—solid
spgs—springs
sq-t-sht—square tube core sheet case
stk—stock
sub-f—sub-frame
ther—thermo-syphon
tor-a—torque arm
tor-t—torsion tube
vacm—vacuum
wd—wood
w-d—multiple disk in oil
worm—top worm
w-p—wet plate
zz-t-sht—zig-zag tube core sheet case

Prices are exclusive of the 3 per cent. Government war tax

Commercial Vehicles for 1918—Continued

ENGINE				TRANSMISSION											BRAKES		CONTROL			UNIVERSALS		
SPEED		FUEL SYS.		CLUTCH		GEARSET				FINAL DRIVE							STEERING GEAR					
Motor in R.p.m.	Truck in M.p.h.	Carbureter Make	Fuel Feed	Type	Make	Type	Make	Placed	Speeds	Type	Axle Make	Total Gear Reduction	Propulsion Taken By	Torque Taken By	Springs Make	Foot	Hand	Placed	Make	Levers	Type	Make	Name and Model
1,200	14½	Shkspr.	grav.	cone.	Hart.	selec.	Covert.	amid.	3	in-g.	Russl.	9.4	spgs.	spgs.	Perf.	int-r-w.	ext-r-w.	l.	own.	c.	Metl.	Spicer.	Columbia E-7
1,360	20	Zenith.	vacm.	cone.	Dtrt.	selec.	Dtrt.	mtr.	3	in-g.	Torb.	7.0	spgs.	spgs.	Dtrt.	int-r-w.	ext-r-w.	l.	Hays.	c.	Metl.	Spicer.	Commerce E
		Zenith.	grav.	d-d.	Warner	selec.	Warner	mtr.	3	worm	Timkn.	7.0	spgs.	spgs.	A-D.	int-r-w.	int-r-w.	l.	Wrnr.	c.			Concord B
1,275			grav.	d-d.	Warner	selec.	Warner	mtr.	3	worm.	Timkn.	8.5	spgs.	spgs.	A-D.	int-r-w.	int-r-w.	l.	Ross.	c.			Concord A
		Stmbg.		d-d.		selec.		mtr.	3	worm.		7.7	spgs.	spgs.									Continental FL
		Stmbg.		d-d.		selec.		mtr.	3	worm.		9.2	spgs.	spgs.									Continental HL
		Stmbg.		d-d.		selec.		mtr.	3	worm.		9.2	spgs.	spgs.									Continental J
	18	Stmbg.		d-d.		selec.		mtr.	3	worm.		10.5	spgs.	spgs.						c.			Continental M
1,080	18	Stmbg.	grav.	d-d.	Fuller.	selec.	Fuller.	mtr.	3	worm.	Shel.	6.5	spgs.	spgs.	Shel.	int-r-w.	int-r-w.	l.	Lavn.	c.			Corbitt E
1,200	16	Stmbg.	grav.	d-d.	Fuller.	selec.	Fuller.	mtr.	3	worm.	Shel.	7.5	spgs.	spgs.	Shel.	ext-r-w.	int-r-w.	l.	Ross.	c.			Corbitt D
1,075	14	Stmbg.	vacm.	d-d.	B-Lipe.	selec.	B-Lipe.	mtr.	3	worm.	Shel.	8.66	spgs.	spgs.	Shel.	int-r-w.	int-r-w.	l.	Ross.	c.			Corbitt C
1,200	14	Stmbg.	vacm.	d-d.	B-Lipe.	selec.	B-Lipe.	mtr.	4	worm.	Shel.	8.66	spgs.	spgs.	Shel.	int-r-w.	int-r-w.	l.	Ross.				Corbitt B
1,250	12	Stmbg.		m-d.	H-Shaw	mesh.	Cotta.	amid.	3	worm.	Shel.	8.75	spgs.	spgs.	Shel.	int-r-w.	int-r-w.	l.	Ross.	c.			Corbitt A
1,000	10	Stmbg.	vacm.	m-d.	H-Shaw	mesh.	Cotta.	amid.	3	worm	Shel.	8.75	r-rd.	tor-a.	Shel.	int-r-w.	int-r-w.	l.	Ross.	c.			Corbitt AA
		Schblr.	grav.	d-d.				mtr.	3	bevl.		4.5	tor-t.	tor-t.		int-r-w.	int-r-w.						Corliss A
1,500	10	Stmbg.	grav.			selec.			1	bevl.	own.	25.0	r-rd.	r-rd.			ext-i-w.		own.				Couple-Gear HC
1,500	10	Stmbg.	grav.			selec.		amid.	1	bevl.	own.	25.0	r-rd.	r-rd.			ext-i-w.		own.				Couple-Gear AC
1,000	17½	Zenith.	grav.	d-d.	B-Lipe.	selec.	B-Lipe.	mtr.	3	bevl.	Timkn.	5.0	spgs.	spgs.		int-.	ext-r-w.		Lavn.				Croce 17
		Master.		d-d.	Fuller.	selec.	Fuller.	mtr.	3	worm.	Timkn.	7.0	spgs.	spgs.		int-r-w.	int-r-w.		Ross.		Metl.	Arvac.	Dart E
1,100	14	Master.	grav.	d-d.	Muncie	selec.	Muncie	mtr.	4	worm.	Timkn.	9.2	spgs.	spgs.		int-r-w.	int-r-w.		Ross.		Metl.	Arvac.	Dart C-C4
1,100	11	Master.	grav.	d-d.	Warner	selec.	Warner	amid.	4	worm.	Timkn.	10.7	spgs.	spgs.		int-r-w.	int-r-w.		Ross.		Metl.	Arvac.	Dart L
		Stmbg.	grav.		M-Evn.	selec.	own.	jst.	3	chn.	Timkn.		r-rd.			int-r-w.	ext-j-s.		Ross.				Dayton H
		Stmbg.	grav.	d-p.	B-Beck.	selec.	own.	amid.	3	worm	TDB.		r-rd.	tor-a		int-r-w.	int-r-w.		Ross.				Dayton
		Stmbg.	grav.	m-d.	M-Evn.	selec.	own.	jst.	3	chn.	Timkn.		r-rd.			int-r-w.	ext-j-s.		Ross.				Dayton K
		Stmbg.	grav.	m-d.	M-Evn.	selec.	own.	jst.	3	chn.	Timkn.		r-rd.			int-r-w.	ext-j-s.		Ross.				Dayton M
		Stmbg.	grav.	m-d.	M-Evn.	selec.	own.	jst.	3	chn.	Timkn.		r-rd.			int-r-w.	ext-j-s.		Ross.				Dayton E
		Schblr.	grav.	d-d.	Dtrt.	selec.	Dtrt.	mtr.	3	worm.	Shel.	6.2	spgs.	spgs.	Iron.	int-r-w.	int-r-w.	l.	Gem.	c.		Hart.	D-E J
1,225	16	Zenith.	grav.	d-p.	B-Beck.	selec.	Covert.	mtr.	3	worm.	Hays.	7.75	spgs.	spgs.	Iron.	int-r-w.	ext-r-w.	l.	Ross.	c.		Hart.	D-E A
1,233	15	Zenith.	grav.	d-p.	B-Beck.	selec.	Covert.	mtr.	3	worm.	Hays.	8.33	spgs.	spgs.	Iron.	int-r-w.	ext-r-w.	l.	Ross.	c.		Hart.	D-E B
1,123	14	Zenith.	grav.	d-p.	B-Beck.	selec.	Covert.	mtr.	3	worm.	Hays.	8.66	spgs.	spgs.	Iron.	int-r-w.	int-r-w.	l.	Ross.	c.		Hart.	D-E C
1,200	15	Master.	grav.	cone.	Fuller.	selec.	Fuller.	mtr.	3	worm.	Timkn.	8.5	r-rd.	tor-a.	Mthr.	int-r-w.	int-r-w.	l.	Ross.	c.		K-B.	DeKalb E
1,200	13	Master.	grav.	cone.	Fuller.	selec.	Fuller.	mtr.	3	worm.	Timkn.	10.33	r-rd.	tor-a.	Mthr.	int-r-w.	int-r-w.	l.	Ross.	c.		K-B.	DeKalb E
1,440		Zenith.		d-d.		selec.		mtr.	3	in-g.	Russl.	8.2	spgs.	spgs.		int-r-w.	int-r-w.						Denby 12
1,320		Zenith.		d-d.		selec.		mtr.	3	in-g.	Russl.	9.8	spgs.	spgs.		int-r-w.	ext-r-w.						Denby 13
1,200		Zenith.		d-d.		selec.		mtr.	3	in-g.	Russl.	10.9	spgs.	spgs.		int-r-w.	ext-r-w.						Denby 15
	20	Carter.		d-p.	B-Beck.	selec.	G-Lees.	mtr.	3	in-g.	Torb.		spgs.	spgs.		int-r-w.	ext-r-w.		Dit.				Denmo 12
		Stewrt.		d-p.		selec.		mtr.	3	in-g.			spgs.	spgs.		ext-r-w.	int-r-w.						Denmo 10
1,300	18	Rayfld.		d-d.	B-Lipe.	selec.	B-Lipe.	mtr.	3	worm.	Timkn.	7.7	spgs.	spgs.		int-r-w.	int-r-w.		Gem.		Metl.	Spicer.	Diamond-T J5
1,250	16	Rayfld.		d-d.	B-Lipe.	selec.	B-Lipe.	mtr.	3	worm.	Timkn.	7.7	spgs.	spgs.		int-r-w.	int-r-w.		Gem.		Metl.	Spicer.	Diamond-T J4
1,100	15	Rayfld.		d-d.	B-Lipe.	selec.	B-Lipe.	mtr.	3	worm.	Timkn.	7.7	spgs.	spgs.		int-r-w.	int-r-w.		Gem.		Metl.	Spicer.	Diamond-T J3
775	12	Rayfld.		d-d.	B-Lipe.	selec.	B-Lipe.	mtr.	4	worm.	Timkn.	6.8	spgs.	spgs.		int-r-w.	int-r-w.		Gem.		Metl.	Spicer.	Diamond-T L
		Rayfld.		d-d.	B-Lipe.	selec.	B-Lipe.	amid.	4	worm.	Timkn.	13.6	spgs.	spgs.		int-.	int-.		Gem.		Metl.	Spicer.	Diamond-T R
2,000	30	Rayfld.	vacm.		own.		own.		3	chn.	own.	4.0	r-rd.		Tut.	int-r-w.	int-r-w.	l.	Fost.	c.	Metl.	Blood.	Dispatch
1,000	14	Holley.		d-d.		selec.		mtr.	3	chn.		8.0	r-rd.			int-.	ext-.						Doane
1,000	10	Holley.		d-d.		selec.		mtr.	3	chn.		10.5	r-rd.			int-.	ext-.						Deane
1,085	15	Stmbg.		d-d.	own.	selec.	own.	mtr.	3	worm.	Timkn.	7.8	spgs.	spgs.		int-r-w.	int-r-w.		Gem.				Dorris I-B-W
940	12	Schblr.		p.	B-Lipe.	id-c.	Muncie	mtr.	6	in-g.	own.	16.0	r-rd.	tor-a.		ext-sht.	ext-sht.		Lavn.				Duplex D
		Carter.	grav.	cone*	Mech.	prog.	Mech.	mtr.	3	bevl.	Gemco		spgs.	spgs.	Shel.	int-r-w.	int-r-w.	l.	Fost.	c.		own.	Ellsworth 25A
1,100	15	Zenith.	grav.	d-p.	B-Beck.	mesh.	Cotta.	mtr.	3	worm.	Timkn.	7.7	spgs.	spgs.	Mthr.	int-r-w.	int-.	l.	Ross.	c.			Fageol
1,250	15	Zenith.	grav.	d-p.	B-Beck.	selec.	G-L.		3	in-g.	Russl.	9.5	spgs.	spgs.	Russl.	int-r-w.	ext-r-w.	l.	Jacx.	c.	Metl.	Spicer.	Fargo P
1,200	18	Zenith.		d-p.	B-Beck.	selec.	own.		3	worm.	Timkn.	7.0	r-rd.	spgs.		int-r-w.	int-r-w.		Gem.		Metl.	Spicer.	Federal S
1,10	15	Zenith.		dry-p.	B-Beck	selec.		amid.	4	worm.	Timkn.	9.25	r-rd.	spgs.		int-r-w.	int-r-w.		Gem.		Metl.	Spicer.	Federal T
1,031	13	Zenith.		dry-p.	B-Beck	selec.		amid.	4	worm.	Timkn.	8.5	r-rd.	spgs.		int-r-w.	int-r-w.		Gem.		Metl.	Spicer.	Federal U
90	12	Stmbg.		dry-p.	B-Beck	selec.	Warner	amid.	4	worm.	Timkn.	10.3	r-rd.	spgs.		int-r-w.	int-r-w.		Gem.		Metl.	Spicer.	Federal W
1,000	10	Zenith.		d-p.	B-Beck.	selec.	Warner	amid.	4	worm.	Timkn.	11.6	r-rd.	spgs.		int-r-w.	int-r-w.		Gem.		Metl.	Spicer.	Federal X
1,200	15	Zenith.	grav.	d-d.	Fuller.	selec.	Fuller.	mtr.	3	worm.	Shel.	7.7	spgs.	spgs.	Del.	int-r-w.	int-r-w.	l.	Ross.	c.			Forschler AO
1,200	12	Zenith.	grav.	d-d.	Fuller.	selec.	Fuller.	mtr.	3	worm.	Shel.	8.7	spgs.	spgs.	Del.	int-r-w.	int-r-w.	l.	Ross.	c.			Forschler BO
		Holley.	grav.	d-d.	own.	plan.	own.	mtr.	2	worm	own.	7.2	r-rd.	tor-t	own.	int-r-w.	ext-d-s.	l.	own.	c.			Ford
1,100	14	Stmbg.		d.	M-Evn.	id-c.	Cotta.	amid.	3	bevl.	own.	8.9	spgs.	tor-a.		ext-r-w.	ext-sht.		Ross.		Metl.	Blood.	F. W. D. B
1,300	16	Sundm.	grav.	cone.	own.	selec.	own.	amid.	3	in-g.	Russl.	8.2	spgs.	spgs.	Perf.	int-r-w.	ext-r-w.	l.	Levn.	c.			Fulton F-2
1,238	17	Rayfld.	grav.	d-d.	B-Lipe.	selec.	B-Lipe.	mtr.	3	worm.		7.8	spgs.	spgs.		int-r-w.	int-r-w.		Ross.		Metl.	Spicer.	Garford 75B
1,110	14	Rayfld.	grav.	d-d.	B-Lipe.	selec.	B-Lipe.	amid.	3	worm.		8.5	spgs.	spgs.		int-r-w.	ext-r-w.		Ross.		Metl.	Spicer.	Garford 66B
934	13	Rayfld.	grav.	d-d.	B-Lipe.	selec.	B-Lipe.	amid.	3	worm.		7.7	spgs.	spgs.		int-r-w.	ext-r-w.		Ross.		Metl.	Spicer.	Garford 70B
1,041	12	Rayfld.	grav.	d-d.	B-Lipe.	selec.	B-Lipe.	amid.	4	worm.		10.3	r-rd.	spgs.		ext-d-s.	int-r-w		Ross.		Metl.	Spicer.	Garford 77B
1,005	9	Rayfld.	grav.	d-d.	B-Lipe.	selec.	B-Lipe.	jst.	4	chn.		13.3	r-rd.			int-r-w.	ext-d-s.		Ross.		Metl.	Spicer.	Garford 68
920	8	Rayfld.	grav.	d-d.	B-Lipe.	selec.	B-Lipe.	jst.	4	chn.		13.3	r-rd.			int-r-w.	int-d-s.		Ross.		Metl.	Spicer.	Garford 69
		Rayfld.	grav.	d-d.		selec.		amid.	3	worm.	Timkn.	7.5											Garford Tractor
		Rayfld.	grav.	d-d.		selec.		amid.	4	worm.	Timkn.	7.5											Garford Tractor
		Rayfld.	grav.	d-d.		selec.		amid.	4	chn.	own.	7.5											Garford Tractor
1,275	15	Stmbg*	grav.	d-d.	Fuller.	selec.	Fuller.	mtr.	3	worm.	Shel.	7.8	spgs.	spgs.	Tut.	int-r-w.	int-r-w.	l.	Lavn.	c.	Metl.	Blood.	Gary F
1,275	15	Stmbg*	grav.	d-d.	Fuller.	selec.	Fuller.	mtr.	3	worm.	Shel.	7.75	spgs.	spgs.	Tut.	int-r-w.	int-r-w.	l.	Lavn.	c.	Metl.	Blood.	Gary G

ABBREVIATIONS—Makers of Parts

*Other Options
A-K—Atwater-Kent
Aut-L—Auto-Lite
B-Beck—Borg & Beck
B-Lipe—Brown-Lipe
Blng—Berling
Brm—Bremer
Brem—Bremer
Bud—Buda
Can—Candler
Celfr—Celfor
Chgo—Chicago
Con—Continental
Conn—Connecticut
Dtrt—Detroit
Dynt—Dyneto
Eismn—Eisemann
E-M—English & Mersick
Eur—Eureka
Fed—Fedders
Franck—Francke
G&O—G & O Mfg. Co.
GBS—Golden, Belknap & Swartz
G-C—Garden City
Gem—Gemmer
Har—Harrison
Hart—Hartford
Hays—Hayes
Hig—Higgins
H-Shaw—Hele-Shaw
H-S—Herschell-Spillman
Idl—Ideal
Iron—Iron City
Jacx—Jackson-Church-Wilcox
Jhnson—Johnson
Kal—Kalamazoo
K-B—Kinsler-Bennett
Key-H—Keystone-Hindley
Lavn—Lavigne
LeR—LeRoi
Lgt—Light
Ligt—Liggett
Lyc—Lycoming
M'C—McCord
Merl—Merrill
Mil—Milwaukee
Murch—Monarch
Mthr—Mather
Natl—National
N. A.—North American
P & B—Parish & Bingham
Perf—Perfection
Prsh—Parish
R-T—Rome-Turney
Rayfld—Rayfield
Rowl—Wm. Harvey Rowland
Russl—Russel
Rut—Rutenber
Savg—Savage Arms
Salsby—Salisbury
Schblr—Schebler
Shel—Sheldon
Shkspr—Shakespeare
Smth—A. O. Smith
S-P—Spring-Perch
Spltf—Splitdorf
Stewrt—Stewart
Stmbg—Stromberg
Sundmn—Sunderman
S-W—Sparks-Withington
Ther—Thermoid
Timkn—Timken
Torb—Torbenson
Tut—Tuthill
Univ—Universal Machine Co.
Wau—Waukesha
Wilcx—Wilcox
Wis—Wisconsin

Prices are exclusive of the 3 per cent. Government war tax

Technical Specifications of Gasoline

Name and Model	Tons Capacity	Chassis Price	Wheelbase, Inches	FRAME			TIRES			Wheels	ENGINE														
								Size in Ins.							COOLING			IGNITION			ELEC. SYSTEM			GOVERNOR		
				Make	Material	Type	Kind	Front	Rear		Make	No. Cyl. Bore and Stroke—N.A.C.C., Hp.	Cylinders Cast	Water Circ.	Radiator Make	Radiator Core and Case	Type	Make	Spark Advance	Type	Make	Extra Cost	Type	Make	Drive
Gary.....H	2	.....	156	P&B..	p-stl.	flex..	s....	36x4s	36x6s	wd..	Bud..	4-4½x5½-28.9	4	cent...	Chgo	zz-t-sh..	sing..	Eismn	fix..	opt...	Vesta.	.....	cent..	Simplex.	motor.
Gary.....HU	3	.....	162	P&B..	p-stl.	flex..	s....	36x4s	36x7s	wd..	Bud..	4-4½x5½-28.9	4	cent...	Perf..	.....	sing..	Eismn	auto.	opt...	Vesta.	.....	cent..	Simplex.	motor.
Gary.....K	4	.....	162	own...	rol-c.	s-flx..	s....	36x5s	36x5d	wd..	Bud..	4-4½x6 -32.4	4	cent...	Perf..	-cst..	sing..	Eismn	auto.	opt...	Vesta.	.....	cent..	Duplex.	dplx..
G. A. Schacht.....	2	2,750	138	own...	rol-c.	flex..	s....	36x3½s	36x6s	wd..	Bud..	4-4½x5½-28.9	4	cent...	own..	cel-p-s..	sing..	Bosch.	hand.	none..	none..	.....	cent..	own....	motor.
G. A. Schacht.....	2½	3,000	156	own...	rol-c.	flex..	s....	36x4s	36x4d	wd..	Bud..	4-4½x5½-28.9	4	cent...	own..	zz-t-ci..	sing..	Bosch.	hand.	none..	none..	.....	cent..	own....	motor.
G. A. Schacht.....	3½	3,400	168	own...	rol-c.	flex..	s....	36x5s	36x5d	wd..	Bud..	4-4½x5½-28.9	4	cent...	own..	zz-t-ci..	sing..	Bosch.	hand.	none..	none..	.....	cent..	own....	motor.
G. A. Schacht.....	5	4,400	168	own...	rol-c.	flex..	s....	36x5s	40x6d	wd..	Bud..	4-4½x5½-28.9	4	cent...	own..	zz-t-ci..	sing..	Bosch.	hand.	none..	none..	.....	l-b...	Dulpex..	motor.
Gem.....	½	675	..	.....	.....	.....	pnu..	31x4	31x4	....	GBS.	4-3½x4½-22.5	4	ther...	.....	.....	sing..	Conn..	hand.	s&l...	Dynto	.....	.....	.....	.....
Geneva.....	½	.....	96	.....	.....	.....	s....	34x2	36x2½	....	.....	2-5½x4½-22.1	1	.....	.....	.....	sing..	Simms	fix..	.....	.....	.....	.....	.....	.....
Gersix.....C	2½	2,500	150*	.....	.....	.....	s....	36x4	36x7	....	Wis.	6-3½x5½-33.8	6	.....	.....	.....	sing..	West..	hand.	s&l...	West..	.....	suct..	Mnrch..	motor.
Globe.....A1	1	1,375	132	own...	rol-c.	flex..	s....	34x3½s	34x4s	wd..	Con..	4-3½x5 -19.6	4	cent...	Perf..	.....	sing..	Eismn	fix..	none..	none..	.....	cent..	Pierce...	motor.
G.M.C.....16	¾	1,395	132	.....	p-stl.	s-flx..	pnu..	35x5s	35x5s	wd..	Con..	4-3½x5 -22.5	4	cent...	McC.	fin-sht..	sing..	Eismn	hand.	opt...	opt....	.....	suct..	Mnrch..	motor.
G.M.C.....21	1	1,950	136	.....	p-stl.	s-flx..	opt..	34x3½s	34x5s	wd..	Con..	4-3½x5 -22.5	4	cent...	McC.	fin-cst..	sing..	Eismn	hand.	opt...	opt....	.....	suct..	Mnrch..	motor.
G.M.C.....31	1½	2,350	144	.....	p-stl.	s-flx..	s....	36x3½s	36x5s	wd..	Con..	4-3½x5 -22.5	4	cent...	McC.	fin-cst..	sing..	Eismn	hand.	opt...	opt....	.....	suct..	Mnrch..	motor.
G.M.C.....41	2	2,690	158	.....	p-stl.	s-flx..	s....	36x4s	36x4d	wd..	Con..	4-4½x5½-27.2	4	cent...	McC.	fin-cst..	sing..	Eismn	hand.	opt...	opt....	.....	suct..	Mnrch..	motor.
G.M.C.....71A	3½	3,750	163	own...	rol-c.	s-flx..	s....	36x5s	40x5d	wd..	Con..	4-4½x5½-32.4	2	cent...	McC.	fin-cst..	sing..	Eismn	hand.	.....	.....	.....	suct..	Mnrch..	motor.
G.M.C.....101A	5	4,350	163	own...	rol-c.	s-flx..	s....	36x6s	40x6d	wd..	Con..	4-4½x5½-32.4	2	cent...	McC.	fin-cst..	sing..	Eismn	hand.	ltg....	Vesta.	.....	suct..	Mnrch..	motor.
Gramm-Bernstein....W	1	1,900	124	.....	p-stl.	s-flx..	s....	34x3½s	34x4s	wd..	Wau.	4-3½x5½-22.5	4	cent...	own..	fin-cst..	sing..	Eismn	hand.	none..	none..	.....	cent.	Wau....	motor.
Gramm-Bernstein....W	1½	2,300	130	.....	p-stl.	s-flx..	s....	34x3½s	36x5s	wd..	Wau.	4-3½x5½-22.5	4	cent...	own..	fin-cst..	sing..	Eismn	hand.	none..	none..	.....	cent..	Wau....	motor.
Gramm-Bernstein....W	2	2,600	146	.....	p-stl.	s-flx..	s....	34x4s	34x3½s	wd..	Wau.	4-3½x5½-22.5	4	cent...	own..	fin-cst..	sing..	Eismn	hand.	none..	none..	.....	cent..	Wau....	motor.
Gramm-Bernstein....W	2½	3,150	156	.....	p-stl.	s-flx..	s....	36x4s	36x4d	wd..	Wau.	4-4½x5½-28.9	2	cent...	own..	fin-cst..	dual..	Eismn	hand.	opt 2..	West..	200	cent..	Wau....	motor.
Gramm-Bernstein....W	3½	3,800	158	.....	p-stl.	s-flx..	s....	36x5s	40x5d	wd..	Wau.	4-4½x5½-32.4	2	cent...	own..	fin-cst..	dual..	Eismn	hand.	opt 2..	West..	200	cent..	Wau....	motor.
Gramm-Bernstein....W	5	4,700	168	.....	p-stl.	s-flx..	s....	36x6s	40x6d	c-s..	Wau.	4-4½x6½-36.1	2	cent...	own..	fin-cst..	dual..	Eismn	hand.	opt 2..	West..	200	cent..	Wau....	motor.
G.V.-Mercedes.....FV	6	.....	192¼	.....	.....	.....	s....	34x5	40x6d	....	own..	4-4½x5⅛-29.0	2	pump..	.....	.....	sing..	Bosch.	fix..	.....	.....	.....	cent..	own....	motor.
Hahn.....	¾	1,100	120*	Prsh..	.....	.....	s....	36x3	36x3½	....	Con..	4-3½x5 -14.4	4	pump..	.....	.....	sing..	Eismn	hand.	.....	.....	.....	cent..	Pierce...	motor.
Hahn.....	1½	1,950	144*	Prsh..	.....	.....	s....	36x3½	36x3½d	....	Con..	4-4½x5½-27.2	....	.....	.....	.....	.....	Bosch.	hand.	.....	.....	.....	cent..	Pierce...	motor.
Hahn.....	3½	2,900	148*	Prsh..	.....	.....	s....	36x5	36x5d	....	Con..	4-4½x5½-32.4	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hall.....	2	2,350	144	own...	rol-c.	.....	s....	36x4s	36x4d	....	Con..	4-4½x5½-27.2	4	pump..	Long.	fin-cst..	sing..	Bsch*	fix..	ltg....	Bosch.	.....	suct..	Mnrch..	motor.
Hall.....	3½	3,250	144	own...	rol-c.	.....	s....	36x5s	36x5d	....	Con..	4-4½x5½-32.4	2	pump..	Long.	fin-cst..	sing..	Bsch*	fix..	ltg....	Bosch.	.....	suct..	Mnrch..	.....
Hall.....	5	4,200	144	own...	rol-c.	.....	s....	36x5s	36x5d	....	Con..	4-4½x5½-32.4	2	pump..	Long.	fin-cst..	sing..	Bsch*	fix..	opt....	.....	.....	suct..	Mnrch..	motor.
Hall.....	5	.....	144	own...	rol-c.	s-flx..	s....	36x5s	40x6d	....	Con..	4-	....	pump..	Long.	fin-cst..	.....	.....	.....	opt....	.....	.....	.....	Mnrch..	.....
Harrison.....C	3½	.....	.....	.....	.....	.....	s....	37x5	36x7	....	Con..	4-4½x5 -32.4	....	.....	.....	.....	hand.	Bosch.	.....	.....	.....	.....	cent..	own....	motor.
Harrison.....F	3½	.....	.....	.....	.....	.....	s....	37x5	37x5d	....	Con..	4-4½x5 -32.4	....	.....	.....	.....	hand.	Bosch.	.....	.....	.....	.....	cent..	own....	motor.
Harvey.....WFA	2½	2,500	150	own...	rol-c.	rigid.	s....	36x4s	36x7s	wd..	Bud..	4-4½x5½-29.0	4	cent...	Chgo	fin-cst..	sing..	Eismn	auto.	sl&i...	West..	175	cent..	Duplex..	motor.
Harvey.....WHA	3½	3,250	160	own...	rol-c.	rigid.	s....	36x5s	36x5d	wd..	Bud..	4-4½x6 -32.4	4	gear...	Chgo	fin-cst..	sing..	Eismn	auto.	sl&i...	West..	175	.....	Duplex..	motor.
Harvey.....WKA	5	4,000	160	own...	rol-c.	rigid.	s....	36x6s	40x6d	wd..	Bud..	4-4½x6 -32.4	4	gear...	Chgo	fin-cst..	sing..	Eismn	auto.	sl&i...	West..	175	cent..	Duplex..	motor
Harvey Tractor.....HT	7	4,000	125	own...	rol-c.	rigid.	s....	36x5s	36x5d	wd..	Bud..	4-4½x6 -32.4	4	cent...	Chgo	fin-cst..	sing..	Eismn	auto.	sl&i...	West..	175	.....	Duplex..	.....
Hawkeye.....J	1½	1,750	146	own...	rol-c.	s-flx..	s....	34x3½s	34x5s	wd..	Bud..	4-3½x5½-22.5	4	ther...	own..	.....	sing..	Eismn	hand.	sl&i2..	West..	175	cent..	Duplex..	duplx.
Hendrickson.....G	2	.....	.....	.....	rol-c.	.....	s....	36x4s	36x4d	wd..	Wau.	4-4½x5½-28.9	2	cent...	Chgo	fin-cst..	sing..	Dixie..	hand.	.....	.....	.....	suct..	Wau....	motor.
Hendrickson.....H	3½	3,000	.....	.....	rol-c.	.....	s....	36x5s	36x5d	wd..	Wau.	4-4½x5½-32.4	2	cent...	Chgo	fin-cst..	sing..	Dixie..	hand.	ltg 2..	.....	22	cent..	Wau....	motor.
Highway Tractor.....A	5	.....	93	.....	rol-c.	rigid.	s....	34x8s	36x4s	wd..	Wei.	4-3½x5½-22.5	4	cent...	Can..	zz-t-ps..	sing..	Eismn	hand.	opt....	opt....	.....	.....	.....	.....
Higrade.....A17	¾	.....	115	.....	p-stl.	flex..	pnu.	34x4½s	34x4½s	wd..	Wis.	4-3½x5 -16.9	4	ther...	.....	zz-t-ca..	sing..	Simms	hand.	s&l2..	L-N....	.....	.....	Simplex.	dshft..
Hoover.....15B	1	1,375	120	.....	p-stl.	rigid.	pnu.	32x4s	33x4½s	wd..	Con..	4-3½x5 -19.6	4	ther...	Can..	sq-t-sht..	dual..	Dixie..	hand.	none..	none..	.....	none..	none..	none..
Horner.....	1½	2,600	145	.....	rol-c.	rigid.	s....	36x4s	36x4s	wd..	Con..	4-4½x5½-27.2	4	cent...	own..	fin-p-st..	dual..	Bosch.	hand.	ltg....	Vesta.	.....	cent..	Mnrch..	.....
Horner.....	2	2,750	145	.....	rol-c.	rigid.	s....	36x4s	36x3½d	wd..	Con..	4-3½x5½-15.6	4	cent...	own..	fin-p-st..	dual..	Bosch.	hand.	ltg....	Vesta.	.....	cent..	Mnrch..	.....
Horner.....	3	3,550	145	.....	rol-i.	rigid.	s....	36x5s	40x5d	wd..	Con..	4-4½x5½-32.4	2	cent...	own..	fin-p-st..	dual..	Bosch.	hand.	ltg....	Vesta.	.....	suct..	Mnrch..	.....
Horner.....	5	4,750	156	.....	rol-i.	rigid.	s....	38x5s	40x6d	wd..	Con..	4-	2	cent...	own..	fin-p-st..	dual..	Bosch.	hand.	ltg....	Vesta.	.....	suct..	Mnrch..	motor.
Hurlburt.....1	1½	2,350	136	.....	p-stl.	rigid.	s....	34x4s	34x5s	wd..	Bud..	4-3½x5½-22.5	4	cent...	own..	cel-sht..	sing..	Dixie..	hand.	ltg....	Vesta.	none	cent..	.....	motor.
Hurlburt.....2	2	3,300	148	.....	p-stl.	rigid.	s....	36x4s	36x4d	wd..	Bud..	4-4½x5½-28.9	4	cent...	own..	fin-t-ci..	dual..	Dixie..	hand.	ltg....	Vesta.	none	cent..	.....	motor.
Hurlburt.....3	3½	3,850	146	.....	p-stl.	rigid.	s....	36x5s	36x5d	wd..	Bud..	4-4½x6 -32.4	4	cent...	own..	fin-cst..	dual..	Dixie..	hand.	ltg....	Vesta.	none	cent..	.....	motor.
Hurlburt.....5	5	4,600	156	.....	p-stl.	rigid.	s....	36x5s	40x6d	wd..	Bud..	6-3½x5½-33.7	4	cent...	own..	fin-cst..	dual..	Dixie..	hand.	ltg....	Vesta.	none	cent..	.....	motor.
Hurlburt.....7	5	5,500	156	.....	p-stl.	rigid.	s....	36x6s	40x7d	wd..	Bud..	6-3½x5½-33.7	4	cent...	own..	fin-cst..	sing..	Dixie..	hand.	ltg....	Vesta.	none	cent..	.....	motor.
I.H.C.....H	¾	1,450	115	P&B..	p-stl.	s-flx..	s*...	36x3½s	36x4s	wd..	own..	4-3½x5½-19.6	4	cent...	M'C*	fin-p-s..	sing..	Dixie..	hand.	s&l...	N-E..	125	cent..	own....	motor.
I.H.C.....F	1	1,750	128	P&B..	p-stl.	s-flx..	s*...	36x3½s	36x4s	wd..	own..	4-3½x5½-19.6	4	cent...	M'C*	fin-p-s..	sing..	Bosch*	hand.	s&l...	N-E..	125	cent..	own....	motor.
I.H.C.....G	2	2,500	135½	P&B..	p-stl.	s-flx..	s*...	36x3½s	36x6s	wd..	own..	4-4 x5 -25.6	4	ther...	M'C*	fin-cst..	sing..	Bosch'	hand.	s&l...	N-E..	125	cent..	own....	motor.
Independent.....F	1	1,385	128*	.....	.....	.....	s....	36x3*	36x4*	....	Con..	4-3½x5 -19.6	4	.....	.....	.....	.....	Eismn	fix..	s&l...	Jesco.	.....	suct..	Mnrch..	motor.
Independent.....G	2	1,850	144	.....	.....	.....	s....	36x3½	36x5	....	Con..	4-4½x5½-27.2	4	.....	.....	.....	sing..	Eismn	fix..	.....	.....	.....	suct..	Mnrch..	motor.
Indiana.....T	1	1,6 0	135	own...	rol-c.	s-flx..	s....	34x3½s	34x4s	wd..	Wau.	4-3½x5½-19.6	4	cent...	Long.	fin-cst..	sing..	Eismn	hand.	.....	.....	.....	cent..	Wau....	motor.
Indiana.....D	2	2,350	150	own...	rol-c.	s-flx..	s....	36x4s	36x7s	wd.	Rut..	4-4½x5½-27.2	2	cent...	Long.	fin-cst..	sing.	Bosch.	hand.	.....	.....	.....	cent..	Pierce...	motor.
Indiana.....R	3½	3,000	156	own...	rol-c.	s-flx..	s....	36x5s	36x5d	wd.	Wau.	4-4½x5½-28.9	2	cent...	Lnog.	fin-cst..	sing.	Bosch.	hand.	.....	.....	.....	cent..	Wau....	motor.
Indiana.....L	5	4,000	168	own...	rol-c.	s-flx..	s....	36x5s	40x6d	c-s..	Wau.	4-4½x6½-36.1	2	cent...	Long.	sq-t-ci..	dual..	Bosch.	hand.	.....	.....	.....	cent..	Wau....	.....
Kearns.....D	¼	850c	107	p-stl.	.....	.....	pnu..	30x3½s	30x3½s	wd.	Lyc..	4-3½x5 -16.9	4	ther...	Bush.	p-p-stl..	sing.	Conn..	hand.	sl&i2..	Dyn....	.....	.....	none....	.....
Kelly-Springfield....K31	1½	2,500	144*	.....	.....	.....	s*...	36x3½*	36x6*	....	own..	4-3½x5½-22.5	4	pump..	.....	.....	sing.	Eismn	auto.	s&l...	R&M..	.....	cent..	own....	motor.
Kelly-Springfield....K32	1½	2,500	144*	.....	.....	.....	s*...	36x3½*	36x6*	....	own..	4-3½x5½-22.5	4	pump..	.....	.....	sing.	Eismn	auto.	s&l...	R&M..	.....	cent..	own....	motor.
Kelly-Springfield....K36	2½	3,000	144*	.....	.....	.....	s*...	36x4*	36x4d*	....	own..	4-3½x5½-22.5	4	pump..	.....	.....	sing.	Eismn	auto.	s&l...	R&M..	.....	cent..	own....	motor.
Kelly-Springfield....K35	2½	3,000	144*	.....	.....	.....	s*...	36x4*	36x4d*	....	own..	4-3½x5½-22.5	4	pump..	.....	.....	sing.	Eismn	auto.	s&l...	R&M..	.....	cent..	own....	motor.
Kelly-Springfield....K40	3½	3,850	150*	.....	.....	.....	s*...	38x5*	38x5d*	....	own..	4-4½x6½-32.4	3	pump..	.....	.....	sing.	Eismn	auto.	s&l...	R&M..	.....	cent..	own....	motor.
Kelly-Springfield....K45	4	4,000	150*	.....	.....	.....	s*...	38x5*	40x6d*	....	own..	4-4½x6½-32.4	2	pump..	.....	.....	sing.	Eismn	auto.	s&l...	R&M..	.....	cent..	own....	motor.
Kelly-Springfield....K50	5	4,600	150*	.....	.....	.....	s*...	38x6*	40x6d*	....	own..	4-4½x6½-32.4	2	pump..	.....	.....	sing.	Eismn	auto.	s&l...	R&M..	.....	cent..	own....	motor.
Kelly-Springfield....K60	6	4,750	150*	.....	.....	.....	s*...	38x6*	40x7d*	....	own..	4-4½x6½-32.4	2	pump..	.....	.....	sing.	Eismn	auto.	s&l...	R&M..	.....	cent..	own....	motor.
King.....	3½	2,800	120	own...	rol-c.	flex..	s....	36x5s	36x5d	wd.	Con..	4-4½x5½-32.4	2	cent...	Liv..	z-z-t-s..	Dual.	Bosch.	2-pt..	none..	none..	.....	cent..	Pierce...	motor.

ABBREVIATIONS—Types of Construction

*Other Options
amid—amidships
auto—automatic
c—center
c&l—center and left
c-s—cast steel
cent—centrifugal
cel-cst—cellular core cast case
cel-sht—cellular core sheet case
cylinders cast, 2 in pairs
cylinders cast, 4 in block
cylinders cast, 3 in threes
cylinders cast, 1 singly
d—dual
d-d—dry disk
d-p—dry plate
d-rd—double reduction
elec—electric
ext-dst—external drive-shaft
ext-f-s—external front wheels.
ext-jst—external jack-shaft
ext-r-w—external rear wheel
fab—fabric
fin-sht—finned tube core sheet case
fix—fixed
flex—flexible
fric—friction
grav—gravity
gset—gearset
hyd—hydraulic
ind-c—individual clutch
int-dst—internal drive-shaft
int-f-w—internal front wheels
in-g—internal gear
in-g-4—internal gear drive on 4 wheels
int-r-w—internal rear wheel
jst—unit with jackshaft
l—left
ltg—lighting
metl—metal
mtr—unit with motor
opt—optional
plst—piston pump
plan—planetary
pnu—pneumatic
pres—pressure
prog—progressive sliding gear
p-stl—pressed steel
r—right
r-a—unit with rear axle
ring-cst—ring core cast case
rol-c—rolled channel
rol-i—rolled I-beam
r-rd—radius rods
selec—selective sliding gear
s-flx—semi-flexible
s & l—starting and lighting
s, l & i—starting, lighting and ignition
s, l & i 2—starting, lighting and ignition two-unit
sing—single
s—solid
spgs—springs
sq-t-sht—square tube core sheet case
stk—stock
sub-f—sub-frame
ther—thermo-syphon
tor-a—torque arm
tor-t—torsion tube
vacm—vacuum
wd—wood
w-d—multiple disk in oil
worm—top worm
w-p—wet plate
zz-t-sht—zig-zag tube core sheet case

Prices are exclusive of the 3 per cent. Government war tax

Commercial Vehicles for 1918—Continued

ENGINE				TRANSMISSION												BRAKES		CONTROL			UNIVERSALS		
SPEED		FUEL SYS.		CLUTCH		GEARSET				FINAL DRIVE								STEERING GEAR					
Motor in R.p.m.	Truck in M.p.h.	Carbureter Make	Fuel Feed	Type	Make	Type	Make	Placed	Speeds	Type	Axle Make	Total Gear Reduction	Propulsion Taken By	Torque Taken By	Springs, Make	Foot	Hand	Placed	Make	Levers	Type	Make	Name and Model
1,275	15	Stmbg*	grav.	d-d.	Fuller.	selec.	Fuller.	mtr.	3	worm.	Shel.	8.75	spgs.	spgs.	Tut.	int-r-w.	int-r-w.	l.	Lavn.	c.	metl.	Blood.	Gary H
1,275	15	Stmbg*	grav.	d-d.	Fuller.	selec.	Fuller.	mtr.	3	worm.	Shel.	8.75	spgs.	spgs.	Tut.	int-r-w.	int-r-w.	l.	Lavn.	c.	metl.	Blood.	Gary HU
1,200	12	Stmbg.	grav.	d-d.	Warner	selec.	Warner	amid.	4	worm.	Shel.	8.75	spgs.	spgs.	Tut.	int-r-w.	int-r-w.	l.	Lavn.	c.	metl.	Blood.	Gary K
900	16	Shbir.	grav.	cone.	Hart.	selec.	own.	amid.	3	worm.	own.	7.75	r-rd.	tor-a.	Natl.	int-r-w.	ext-r-w.	l.	Brns.	c.	metl.	Blood.	G. A. Schacht
900	14	Schblr.	grav.	cone.	Hart.	selec.	own.	amid.	3	worm.	own.	8.66	r-rd.	tor-a.	Natl.	int-r-w.	ext-r-w.	l.	Brns.	c.	metl.	Blood.	G. A. Schacht
900	12	Schblr.	grav.	cone.	Hart.	selec.	own.	amid.	3	worm.	own.	10.3	r-rd.	tor-a.	Natl.	int-r-w.	ext-r-w.	l.	Brns.	c.	metl.	Blood.	G. A. Schacht
1,000	10	Schblr.	grav.	cone.	Hart.	selec.	own.	amid.	3	worm.	own.	14.0	r-rd.	tor-a.	Natl.	int-r-w.	ext-d-s.	l.	Brns.	c.	metl.	Blood.	G. A. Schacht
.....	.....	Carter.	.....	d-d.	GBS.	selec.	G-L.	mtr.	3	bevel.	W-M.	4	spgs.	spgs.	.....	int-r-w.	ext-r-w.	.....	Fost.	.....	.....	.....	Gem
.....	18	Schblr.	.....	d-p.	.....	plan.	.....	jst.	2	chn.	.....	.....	r-rd.	.....	.....	.....	.....	.....	.....	.....	.....	Spicer.	Geneva 1
1,050	13	Rayfld	vacm.	d-p.	B-Beck.	id-c.	Cotta.	mtr.	3	worm.	Emp.	8.6	spgs.	spgs.	.....	int-r-w.	ext-r-w.	.....	Ross.	.....	.....	.....	Gersix C
1,383	20	Master.	vacm.	d-p.	B-Beck.	selec.	Covert.	mtr.	3	in-g.	Celfr.	7.0	spgs.	spgs.	Shel.	int-r-w.	ext-r-w.	l.	Lavn.	c.	.....	.....	Globe A1
1,150	20	Marvel.	grav.	d-d.	own.	selec.	own.	mtr.	3	bevl.	W-M.	6.0	r-rd.	spgs.	W-M.	int-r-w.	ext-r-w.	l.	Jacx.	c.	metl.	Univ.	G.M.C. 16
1,380	18	Marvel.	grav.	d-d.	own.	selec.	own.	mtr.	3	worm.	Timkn.	7.75	r-rd.	spgs.	Dtrt.	int-r-w.	int-r-w.	l.	Lavn.	c.	metl.	Univ.	G.M.C. 21
1,300	15	Marvel.	grav.	d-d.	own.	selec.	own.	mtr.	4	worm.	Timkn.	9.25	r-rd.	spgs.	Dtrt.	int-r-w.	int-r-w.	l.	Lavn.	c.	metl.	Univ.	G.M.C. 31
1,210	14	Marvel.	grav.	d-d.	own.	selec.	own.	mtr.	4	worm.	Timkn.	10.25	r-rd.	spgs.	Dtrt.	int-r-w.	int-r-w.	l.	Lavn.	c.	metl.	Univ.	G.M.C. 41
1,210	12	Marvel.	grav.	d-d.	own.	selec.	own.	amid.	4	worm.	Timkn.	12.0	r-rd.	spgs.	Dtrt.	int-r-w.	int-r-w.	l.	Lavn.	c.	metl.	Univ.	G.M.C. 71A
1,150	10	Marvel.	grav.	d-d.	own.	selec.	own.	amid.	4	worm.	Timkn.	13.7	r-rd.	spgs.	Dtrt.	int-r-w.	int-r-w.	l.	Lavn.	c.	metl.	Univ.	G.M.C. 101A
1,300	20	Zenith.	grav.	d-d.	own.	mesh.	own.	amid.	3	worm.	Shel.	6.5	spgs.	spgs.	Shel.	int-r-w.	int-r-w.	l.	Ross.	c.	.....	.....	Gramm-Bernstein W
1,200	17	Zenith.	grav.	d-d.	own.	mesh.	own.	amid.	3	worm.	Shel.	7.75	spgs.	spgs.	Shel.	ext-r-w.	int-r-w.	l.	Ross.	c.	.....	.....	Gramm-Bernstein W
1,200	16	Zenith.	grav.	d-d.	own.	mesh.	own.	amid.	3	worm.	Shel.	8.66	spgs.	spgs.	Shel.	ext-r-w.	int-r-w.	l.	Ross.	c.	.....	.....	Gramm-Bernstein W
1,150	16	Zenith.	grav.	d-d.	own.	mesh.	own.	amid.	3	worm.	Shel.	7.75	spgs.	spgs.	Shel.	int-r-w.	int-r-w.	l.	Ross.	c.	.....	.....	Gramm-Bernstein W
1,100	16	Zenith.	grav.	d-d.	own.	mesh.	own.	amid.	4	worm.	Shel.	.....	spgs.	spgs.	Shel.	int-r-w.	int-r-w.	l.	Ross.	c.	.....	.....	Gramm-Bernstein W
1,050	11	Zenith.	grav.	cone.	own.	mesh.	own.	amid.	4	worm.	Shel.	9.5	spgs.	spgs.	Shel.	int-r-w.	int-r-w.	l.	Ross.	c.	.....	.....	Gramm-Bernstein W
850	10	own.	.....	cone.	.....	selec.	.....	amid.	4	in-g.	.....	9.3	r-rd.	tor-a.	.....	ext-r-w.	ext-sht.	.....	.....	.....	.....	.....	G.V.-Mercedes FV
1.175	18	Stmbg.	grav.	d-d.	B-Lipe.	selec.	B-Lipe.	mtr.	3	worm.	Torb.	7.0	spgs.	spgs.	.....	int-r-w.	ext-r-w.	.....	Lavn.	.....	metl.	Spicer.	Hahn
980	15	Stmbg.	grav.	d-d.	B-Lipe.	selec.	B-Lipe.	mtr.	3	worm.	Timkn.	7.0	r-rd.	tor-a.	.....	.....	.....	.....	Ross.	.....	metl.	Spicer.	Hahn
.....	.....	.....	.....	.....	B-Lipe.	.....	B-Lipe.	.....	.....	.....	Timkn.	.....	.....	.....	.....	.....	.....	.....	Ross.	.....	metl.	Spicer.	Hahn
.....	18	Zenith.	grav.	m-d.	B-Beck.	selec.	Covert.	mtr.	3	.....	Timkn.	.....	spgs.	spgs.	Dtrt.	int-r-w.	int-r-w.	l.	Gem.	c.	metl.	K-B.	Hall
.....	15	Zenith.	grav.	d-d.	B-Lipe.	selec.	B-Lipe.	mtr.	3	.....	Timkn.	.....	spgs.	spgs.	Dtrt.	int-r-w.	int-r-w.	l.	Gem.	c.	metl.	K-B.	Hall
.....	12	Zenith.	grav.	d-d.	B-Lipe.	selec.	B-Lipe.	mtr.	4	.....	Timkn.	.....	spgs.	spgs.	Dtrt.	int-r-w.	int-r-w.	l.	Gem.	c.	metl.	K-B.	Hall
.....	.....	Zenith.	.....	d-d.	B-Lipe.	selec.	B-Lipe.	jst.	3	.....	Timkn.	.....	spgs.	spgs.	Dtrt.	int-r-w.	int-r-w.	l.	Gem.	c.	metl.	K-B.	Hall
1,025	12	Schblr.	grav.	cone.	own.	selec.	Roch.	jst.	3	chn.	own.	9.4	r-rd.	.....	.....	int-r-w.	ext-r-w.	.....	own.	.....	.....	.....	Harrison C
1,000	12	Schblr.	grav.	cone.	own.	selec.	B-Lipe.	jst.	3	chn.	Timkn.	9.6	r-rd.	.....	.....	int.	ext.	.....	Ross.	.....	.....	.....	Harrison F
1,000	16	Stmbg.	grav.	d-p.	B-Beck.	selec.	B-Lipe.	amid.	4	worm.	Shel.	7.75	spgs.	spgs.	Shel.	int-r-w.	int-r-w.	l.	Ross.	c.	metl.	Spicer.	Harvey WFA
1,000	13	Stmbg.	grav.	d-p.	B-Beck.	selec.	B-Lipe.	amid.	4	worm.	Shel.	8.75	spgs.	spgs.	Shel.	int-r-w.	int-r-w.	l.	Ross.	c.	metl.	Spicer.	Harvey WHA
1,000	11	Stmbg.	grav.	d-p.	B-Beck.	selec.	B-Lipe.	amid.	4	worm.	Shel.	8.75	spgs.	spgs.	Shel.	int-r-w.	int-r-w.	l.	Ross.	c.	metl.	Spicer.	Harvey WKA
1,000	11	Stmbg.	grav.	d-p.	B-Beck.	selec.	B-Lipe.	amid.	4	worm.	Shel.	8.75	spgs.	spgs.	Shel.	int-r-w.	int-r-w.	l.	Ross.	.....	metl.	Spicer.	Harvey Tractor HT
.....	15	Master.	vacm.	d-p.	B-Beck.	selec.	G-Lees.	mtr.	3	in-g.	Celfr.	7.0	spgs.	spgs.	Tut.	int-r-w.	ext-r-w.	l.	Lavn.	l.	metl.	Univ.	Hawkeye J
1,000	15	Stmbg.	grav.	d-d.	Fuller.	.....	Fuller.	mtr.	.....	worm.	Timkn.	7.75	r-rd.	tor-a.	Tut.	ext-r-w.	ext-r-w.	l.	Ross.	c.	.....	.....	Hendrickson G
1,100	14	Stmbg.	grav.	d-d.	B-Beck.	prog.	Cotta.	mtr.	3	worm.	Timkn.	10.3	r-rd.	spgs.	Tut.	int-r-w.	int-r-w.	l.	Ross.	r.	.....	.....	Hendrickson H
.....	.....	Schblr.	grav.	d-d.	B-Beck.	selec.	Warner	mtr.	2	in-g.	own.	13.4	tor-a.	tor-a.	.....	ext-r-w.	int-f-w.	c.	own.	r.	.....	.....	Highway Tractor A
1,000	20	Zenith.	grav.	d-p.	B-Beck.	mesh.	Cotta.	mtr.	3	worm.	Shel.	4.5	spgs.	spgs.	.....	int-r-w.	int.	l.	Lavn.	c*	metl.	Blood.	Higrade A17
.....	.....	Schblr.	vacm.	d-d.	Fuller.	selec.	Fuller.	mtr.	3	worm.	Shel.	6.5	spgs.	spgs.	Shel.	int-r-w.	int-r-w.	l.	Lavn.	c.	.....	.....	Hoover 15B
.....	.....	Master.	grav.	d-d.	B-Lipe.	selec.	B-Lipe.	amid.	3	worm.	Timkn.	.....	r-rd.	spgs.	Perf.	.....	int.	l.	Ross.	c.	.....	.....	Horner
.....	.....	Master.	grav.	d-d.	B-Lipe.	selec.	B-Lipe.	amid.	3	worm.	Timkn.	.....	r-rd.	spgs.	Perf.	ext-r-w.	ext-r-w.	l.	Ross.	c.	.....	.....	Horner
.....	.....	Master.	grav.	d-d.	B-Lipe.	selec.	B-Lipe.	amid.	3	worm.	Timkn.	.....	r-rd.	spgs.	Perf.	int-r-w.	int-r-w.	l.	Ross.	c.	.....	.....	Horner
.....	.....	Master.	grav.	d-d.	B-Lipe.	selec.	B-Lipe.	amid.	3	worm.	Timkn.	.....	r-rd.	spgs.	Perf.	int-r-w.	int-r-w.	l.	Ross.	c.	.....	.....	Horner
1,375	18	Shkspr.	grav.	d-d.	B-Lipe.	selec.	B-Lipe.	mtr.	3	worm.	own.	6.25	spgs.	spgs.	Merl.	ext-r-w.	int-r-w.	l.	Lavn.	c.	.....	.....	Hurlburt 1
1,300	16	Shkspr.	grav.	d-d.	B-Lipe.	selec.	B-Lipe.	mtr.	3	worm.	own.	8.66	r-rd.	tor-a.	Merl.	ext-d-s.	int-r-w.	l.	Lavn.	c.	.....	.....	Hurlburt 2
1,050	13	Shkspr.	grav.	d-d.	B-Lipe.	selec.	B-Lipe.	mtr.	3	worm.	own.	8.66	r-rd.	tor-a.	Merl.	ext-d-s.	int-r-w.	l.	Lavn.	c.	.....	.....	Hurlburt 3
1,360	12	Shkspr.	grav.	d-d.	B-Lipe.	selec.	B-Lipe.	mtr.	4	worm.	own.	10.3	r-rd.	tor-a.	Merl.	ext-d-s.	int-r-w.	l.	Lavn.	c.	.....	.....	Hurlburt 5
1,360	12	Shkspr.	grav.	d-d.	B-Lipe.	selec.	B-Lipe.	amid.	4	worm.	own.	13.0	r-rd.	tor-a.	Merl.	int-d-s.	int-r-w.	l.	Lavn.	c.	.....	.....	Hurlburt 7
1,275	17	Holley.	grav.	d-d.	own.	selec.	own.	amid.	3	in-g.	own.	7.0	spgs.	spgs.	Perf.	int-r-w.	int-f-w.	l.	Ross.	c.	.....	own.	I.H.C. H
1,275	17	Holley.	grav.	d-d.	own.	selec.	own.	amid.	3	in-g.	own.	8.0	spgs.	spgs.	Perf.	int-r-w.	int-f-w.	l.	Ross.	c.	.....	own.	I.H.C. F
1,100	11½	Ensign.	vacm.	d-d.	own.	selec.	own.	amid.	3	in-g.	own.	8.0	spgs.	spgs.	Perf.	int-r-w.	int-r-w.	l.	Ross.	c.	.....	own.	I.H.C. G
1,350	.....	Marvel.	grav.	d-d.	B-Lipe.	selec.	B-Lipe.	mtr.	3	worm.	.....	.....	spgs.	spgs.	.....	int-r-w.	int-r-w.	.....	Lavn.	.....	.....	.....	Independent F
.....	.....	Marvel.	grav.	d-d.	.....	selec.	.....	mtr.	3	worm.	.....	.....	spgs.	spgs.	.....	int-r-w.	int-r-w.	.....	.....	.....	.....	.....	Independent G
1,080	15	Stmbg.	grav.	d-p.	B-Beck.	selec.	Covert.	amid.	3	worm.	own.	7.0	spgs.	spgs.	Kal.	int-r-w.	int-r-w.	l.	Lavn.	c.	metl.	Arvac.	Indiana T
1,375	20	Stmbg.	grav.	d-p.	B-Beck.	selec.	Covert.	amid.	3	worm.	Shel.	7.75	r-rd.	spgs.	Kal.	int-r-w.	int-r-w.	l.	Lavn.	c.	metl.	Acme.	Indiana D
1,150	12	Stmbg.	grav.	d-p.	B-Beck.	selec.	B-Lipe.	amid.	4	worm.	Shel.	15.4	r-rd.	spgs.	Shel.	int-r-w.	int-r-w.	l.	Lavn.	c.	metl.	Acme.	Indiana R
800	11	Stmbg.	grav.	d-p.	B-Beck.	selec.	B-Lipe.	amid.	4	worm.	Shel.	8.75	r-rd.	spgs.	Shel.	int-r-w.	int-r-w.	l.	Lavn.	c.	metl.	Spicer.	Indiana L
.....	.....	Carter.	grav.	d-d.	Mech.	selec.	Mech.	mtr.	3	bev.	Peru.	.....	spgs.	.....	Lig.	.....	.....	l.	Lavn.	c.	.....	.....	Kearns D
1,200	15	Rayfld.	grav.	cone.	own.	selec.	Covert.	amid.	3	chn.	.....	.....	r-rd.	.....	.....	int-r-w.	int-r-w.	.....	Gem.	.....	.....	.....	Kelly-Springfield K31
1,200	15	Rayfld.	grav.	cone.	own.	selec.	Covert.	amid.	3	worm.	own.	.....	r-rd.	spgs.	.....	int-r-w.	int-r-w.	.....	Gem.	.....	.....	.....	Kelly-Springfield K32
1,200	11	Rayfld.	grav.	cone.	own.	selec.	Covert.	amid.	3	worm.	own.	.....	r-rd.	spgs.	.....	int-r-w.	int-r-w.	.....	Gem.	.....	.....	.....	Kelly-Springfield K36
1,200	11½	Rayfld.	grav.	cone.	own.	selec.	Covert.	amid.	3	chn.	.....	.....	r-rd.	.....	.....	int-r-w.	int-r-w.	.....	Gem.	.....	.....	.....	Kelly-Springfield K35
1,100	12	Rayfld.	grav.	cone.	own.	selec.	Covert.	amid.	3	chn.	.....	.....	r-rd.	.....	.....	int-r-w.	int-r-w.	.....	Gem.	.....	.....	.....	Kelly-Springfield K40
1,100	12	Rayfld.	grav.	cone.	own.	selec.	Covert.	amid.	3	chn.	.....	.....	r-rd.	.....	.....	int-r-w.	int-r-w.	.....	Gem.	.....	.....	.....	Kelly-Springfield K45
1,100	10½	Rayfld.	grav.	cone.	own.	selec.	Covert.	amid.	3	chn.	.....	.....	r-rd.	.....	.....	int-r-w.	int-r-w.	.....	Gem.	.....	.....	.....	Kelly-Springfield K50
1,100	10½	Rayfld.	grav.	cone.	own.	selec.	Covert.	amid.	3	chn.	.....	.....	r-rd.	.....	.....	.....	.....	.....	Gem.	.....	.....	.....	Kelly-Springfield K60
1,000	12	Schblr.	grav.	d-d.	own.	mesh.	Cotta.	jsh.	3	chn.	own.	8.66	r-rd.	s-fm.	Perf.	int-r-w.	ext-j-s.	r.	Ross.	r.	metl.	Blood.	King

ABBREVIATIONS—Makers of Parts

*Other Options
A-K—Atwater Kent
Aut-L—Auto-Lite
B-Beck—Borg & Beck
B-Lipe—Brown-Lipe
Bing—Berling
Brm—Bremer
Bud—Buda
Can—Candler
Celfr—Celfor
Chgo—Chicago
Con—Continental
Conn—Connecticut
Dtrt—Detroit
Dynt—Dyneto
Eismn—Eisemann
E-M—English & Mersick
Eur—Eureka
Fed—Fedders
Franck—Francke
GBS—Golden, Belknap & Swartz
G&O—G & O Mfg. Co.
G-C—Garden City
Gem—Gemmer
Har—Harrison
Hart—Hartford
Hays—Hayes
Hig—Higgins
H-Shaw—Hele-Shaw
H-S—Herschell-Spillman
Idl—Ideal
Iron—Iron City
Jacx—Jackson-Church-Wilcox
Jhnson—Johnson
Kal—Kalamazoo
K-B—Kinsler-Bennett
Key-H—Keystone-Hindley
Lavn—Lavigne
LeR—LeRoi
Lgt—Light
Ligt—Liggett
Lyc—Lycoming
M'C—McCord
Merl—Merrill
Mil—Milwaukee
Mnrch—Monarch
Mthr—Mather
Natl—National
N. A.—North American
P & B—Parish & Bingham
Perf—Perfection
Prsh—Parish
R-T—Rome-Turney
Rayfld—Rayfield
Rowl—Wm. Harvey Rowland
Russl—Russel
Rut—Rutenber
Salsby—Salisbury
Savg—Savage Arms
Schblr—Schebler
Shel—Sheldon
Shkspr—Shakespeare
Smth—A. O. Smith
S-P—Spring-Perch
Spltf—Splitdorf
Stewrt—Stewart
Stmbg—Stromberg
Sundmn—Sunderman
S-W—Sparks-Withington
Ther—Thermoid
Timkn—Timken
Torb—Torbenson
Tut—Tuthill
Univ—Universal Machine Co.
Wau—Waukesha
Wilcx—Wilcox
Wis—Wisconsin

Prices are exclusive of the 3 per cent Government war tax

Technical Specifications of Gasoline

Name and Model	Tons Capacity	Chassis Price	Wheelbase, Inches	FRAME			TIRES			Wheels	ENGINE															GOVERNOR		
								Sizes in Ins.						COOLING			IGNITION			ELEC. SYSTEM								
				Make	Material	Type	Kind	Front	Rear		Make	No. Cyl. Bore and Stroke—N.A.C.C., Hp.	Cylinders Cast	Water Circ.	Radiator Make	Radiator Core and Case	Type	Make	Spark Advance	Type	Make	Extra Cost	Type	Make	Drive
Kissel	¾	1,185	135	.....	.....	.....	pnu.	32x4	32x4	....	own.	4-3¼x5½-24.0	4	pump.	.....	.....	.....	Eismn	hand.	s&l*...	.....	....	cent..	Pierce...	motor.
Kissel	1½	1,585	152	.....	.....	.....	s....	34x3	34x5	....	own.	4-3¼x5½-24.0	4	pump.	.....	.....	.....	Eismn	hand.	s&l*...	.....	....	cent..	Pierce...	motor.
Kissel	2	2,275	168	.....	.....	.....	s....	34x4	36x7	....	own.	4-4¼x5½-28.9	4	pump.	.....	.....	.....	Eismn	hand.	s&l*...	.....	....	cent..	Pierce...	motor.
Kissel	3½	3,150	168	.....	.....	.....	s....	36x5	36x5d	....	own.	4-4¼x5½-28.9	4	pump.	.....	.....	.....	Eismn	hand.	s&l*...	.....	....	cent..	Pierce...	motor.
Kleiber.....AA	1	2,100	130	.....	rol-c	s-flx	s....	34x3½s	34x5s	wd.	Con.	4-3½x5½-22.5	4	cent...	Perf..	z-z-t-s...	dual..	Bosch.	hand.	.....	.....	....	cent..	Pierce...	motor.
Kleiber.....A	1½	2,500	140	.....	rol-c	s-flx	s....	36x3½s	36x6s	wd.	Con.	4-4¼x5½-27.2	4	cent...	Perf..	z-z-t-s...	dual..	Bosch.	hand.	.....	.....	....	cent..	Pierce...	motor.
Kleiber.....BB	2	2,750	140	.....	rol-c	s-flx	s....	36x4s	36x7s	wd.	Con.	4-4¼x5½-27.2	4	cent...	Perf..	z-z-t-s...	dual..	Bosch.	hand.	.....	.....	....	cent..	Pierce...	motor.
Kleiber.....B	2½	3,200	150	.....	rol-c	s-flx	s....	36x4s	36x4d	wd.	Con.	4-4½x5½-32.4	2	cent...	Perf..	z-z-t-s...	dual..	Bosch.	hand.	.....	.....	....	cent..	Pierce...	motor.
Kleiber.....C	3½	3,850	160	.....	rol-c	s-flx	s....	36x5s	36x5d*	wd.	Con.	4-4½x5½-32.4	2	cent...	Perf..	z-z-t-s...	dual..	Bosch.	hand.	.....	.....	....	cent..	Pierce...	motor.
Kleiber.....D	5	4,900	170	.....	rol-c	s-flx	s....	36x6s	40x6d	wd.	Con.	4-5½x5½-44.2	2	cent...	Perf..	z-z-t-s	dual..	Bosch.	hand.	.....	.....	....	cent..	Pierce...	motor.
Knox.....35	.....	4,500	108½	.....	rol-c	rigid	s....	36x5s	38x6d	c-s.	own.	4-5x5½-40.0	2	cent...	Fed.	cel-sht.	sing.	Eismn	hand.	s&l2...	Bijur.	....	none	none	.....
Knox.....36	3	5,000	108½	.....	rol-c	rigid	s....	36x4s	38x6d*	c-s	own.	4-5x5½-40.0	2	cent...	Fed.	cel-sht.	sing.	Eismn	hand.	s&l2...	Bijur.	....	none	none	none.
Koehler.....K	1½	1,150	129	own...	rol-c	.....	s....	34x3s	34x4s	wd.	own.	4-3½x5 -19.6	4	ther...	own.	fin-cst...	sing.	Eismn	hand.	.....	.....	....	.....	.....	.....
Koehler Tractor.....KT	3	1,550	106	own...	rol-c	rigid	s....	34x3s	34x5s	wd.	own.	4-3½x5 -19.6	4	ther...	own.	fin-cst...	sing.	Eismn	fix...	.....	.....	....	.....	Mnrch.	.....
Lambert.....V2	1	1,700	144	.....	.....	.....	s....	36x3½	36x4	....	Rut.	4-4¼x5½-29.0	1	.....	.....	.....	sing*.	Rem*.	hand.	l&i...	Vesta	....	cent..	Pierce...	motor.
Lamson	1½	1,850	150*	.....	.....	.....	s....	36x3½	36x5	....	Wis.	4-4 x5 -25.6	4	.....	.....	.....	dual..	Bosch.	hand.	l&i...	Vesta	....	cent..	Simplex	.....
Lamson	2½	2,450	160*	.....	.....	.....	s....	36x4	36x7	....	Wis.	4-4 x6 -25.6	4	.....	.....	.....	dual..	Bosch.	hand.	l&i...	Vesta	....	cent..	Simplex	.....
Lamson	3½	3,150	170*	.....	.....	.....	s....	36x5	40x5d	....	Wis.	4-4¾x5½-36.2	2	.....	.....	.....	dual..	Bosch.	hand.	l&i...	Vesta	....	cent..	Simplex	.....
Lamson	5	4,150	180*	.....	.....	.....	s....	36x6	40x6d	....	Wis.	4-5½x5½-41.6	2	.....	.....	.....	dual..	Bosch.	hand.	s&l...	.....	....	.....	Simplex	.....
Lane.....F	1½	1,750	135	own...	rol-c	rigid	s....	34x3½s	34x4s	wd.	Con.	4-3½x5 -19.6	4	ther...	own.	fin-cst...	sing..	Conn..	hand.	s&i2..	Roth..	none	cent.	Pierce...	motor.
Lane.....B	2½	2,500	150	own...	rol-c	rigid	s....	34x4s	36x6s	wd.	Con.	6-3½x5½-29.4	4	cent...	own.	fin-cst...	sing..	Conn..	hand.	s&i2.	Foth.	none	cent..	Pierce...	motor.
Lane.....C	3½	3,250	160	own...	rol-c	rigid	s....	36x5s	36x5d	wd.	Con.	6-3½x5½-33.7	3	cent...	own.	fin-cst...	sing.	Conn..	hand.	s&i2.	Roth.	none	cent..	Pierce...	motor.
Lange.....C	1½	1,950	136	.....	rol-c	rigid	s....	36x4s	38x6s	wd.	Con	4-4½x5½-27.2	4	ther...	Fed.	sq-t-sht..	sing..	Bosch.	hand.	.....	.....	....	cent..	Pierce...	motor.
Lange.....B	2½	2,650	136	.....	rol-c	rigid	s....	36x4s	38x6s	wd.	Con.	4-4½x5½-27.2	4	ther...	Fed.	sq-t-sht..	sing..	Bosch.	hand.	none..	none..	none	cent..	Pierce...	motor.
Lapeer.....A	3	1,500	90	.....	rol-c	s-flx.	s....	32x3½s	32x5s	wd.	Wau	4-3½x5 -19.6	4	cent...	Can.	cel-cst..	sing..	Spltf..	fix...	none..	none..	....	cent..	Wau....	motor.
Lapeer.....C	5	1,900	90	.....	rol-c	s-flx.	s....	32x3½s	32x3½d	wd.	Wau	4-3½x5½-19.6	4	cent...	Can.	cel-cst..	sing..	Spltf..	fix...	none..	none..	....	cent..	Wau....	motor.
Larrabee.....M	1	1,800	130	Prsh..	p-stl	flex..	s....	34x3½s	34x5s	wd.	Con.	4-3½x5 -22.5	4	ther...	Bush.	fin-cst...	sing..	Bosch.	hand.	none..	none..	....	cent..	Pierce...	motor.
Larrabee.....N	1½	2,000	140	Prsh..	p-stl	flex..	s....	36x3½s	36x5s	wd.	Con.	4-4¼x5½-27.2	4	cent...	Bush.	fin-cst...	sing..	Bosch.	hand.	none..	none..	....	cent..	Pierce...	motor.
Larrabee.....O	2½	2,700	154	Prsh..	p-stl	flex..	s....	36x4s	36x7s	wd.	Con.	4-4¼x5½-27.2	4	cent...	Bush.	fin-cst...	sing..	Bosch.	hand.	none..	none..	....	cent..	Pierce...	motor.
Larrabee.....R	3½	3,400	154	Prsh..	p-stl	flex..	s....	36x5s	36x5s	wd.	Con.	4-4½x5½-32.4	4	cent...	Bush.	fin-cst...	sing..	Bosch.	hand.	none..	none..	....	cent..	Pierce...	motor.
Lawson.....35	½	.....	112	.....	.....	.....	pnu.	31x4	31x4	....	GBS	4-3½x4½-22.5	4	.....	.....	.....	sing..	Dixie..	hand.	s&l...	.....	....	.....	.....	.....
Lippard-Stewart...MW	¾	1,025	106	P&B..	p-stl	flex..	pnu.	33x4s	33x4s	wd.	Wis.	4-3½x5 -16.9	4	ther...	Mayo	cel-sht..	sing..	Eismn	fix...	opt...	Remy.	....	.....	.....	.....
Lippard-Stewart.....W	1	1,750	125	P&B..	p-stl	s-flx.	opt..	34x3s*	34x4s*	wd.	Con.	4-3½x5½-22.5	4	cent...	Fed.	cel-sht..	sing..	Eismn	fix...	opt...	Dynt..	....	cent..	Pierce...	motor.
Lippard-Stewart...HW	1	2,000	135	P&B..	p-stl	s-flx.	s....	36x3s	36x5s	wd.	Con.	4-3½x5½-22.5	4	cent...	Fed.	cel-cst..	sing..	Eismn	fix...	s&l...	Dynt..	....	cent..	Pierce...	motor.
Lippard-Stewart.....F	1½	2,450	158	P&B..	p-stl	s-flx.	s....	36x3½s	36x3d	wd.	Con.	4-4¼x5½-27.2	4	cent...	Fed.	cel-cst..	sing..	Eismn	fix...	s&l...	Dynt..	....	cent..	Pierce...	motor.
Lippard-Stewart.....G	2	2,700	165	P&B.	p-stl.	.....	s....	36x4s	36x4d	wd.	Con.	4-4¼x5½-27.2	4	cent...	Fed.	cel-cst..	sing..	Eismn	fix...	s&l...	Dynt..	....	cent..	Pierce...	motor.
Little Giant.....15	¾	1,500	138	.....	.....	.....	p*.	34x4	34x3½	....	.....	4-3½x5 -19.6	4	.....	.....	.....	sing..	Eismn	hand.	.....	.....	....	.....	.....	.....
Little Giant.....H	1	1,400	110	.....	.....	.....	s....	36x3	36x3½	....	Con.	4-3½x5½-19.6	4	.....	.....	.....	sing..	Eismn	hand.	.....	.....	....	.....	.....	.....
Little Giant.....H	1½	1,500	110	.....	.....	.....	s....	36x3½	36x4	....	Bud.	4-3½x5½-19.6	4	.....	.....	.....	sing..	Eismn	hand.	.....	.....	....	.....	.....	.....
Little Giant.....16	2	2,500	144	.....	.....	.....	s....	36x4	36x6	....	Con.	4-4¼x5 -27.2	4	.....	.....	.....	sing..	Eismn	hand.	.....	.....	....	.....	.....	.....
Lumb.....C	2½	1,900	148	.....	rol-c	.....	opt..	.....	.....	wd.	Bud.	4-4¼x5½-28.9	4	cent...	Chgo	fin-cst...	sing..	Bosch.	hand.	ltg....	.....	none	suct..	Mnrch..	.....
Maccar.....L	1½	2,400	150	Prsh..	p-stl	rigid.	s....	36x4s	36x5s	wd.	Con.	4-4½x5½-27.2	4	cent...	Bush.	fin-sht...	sing..	Bosch.	hand.	none..	none..	....	cent..	Pierce...	motor.
Maccar.....H	2½	2,950	162	Prsh..	p-stl	rigid.	s....	36x4s	36x4d	wd.	Con.	4-4½x5½-32.4	2	cent...	own.	fin-cst...	sing..	Bosch.	hand.	none..	none..	....	cent..	Pierce...	motor.
Maccar.....M	3½	3,600	174	Prsh..	p-stl	rigid.	s....	37x5s	37x5d	wd.	.....	4-4½x5½-32.4	2	cent...	own.	fin-cst...	sing..	Bosch.	hand.	none..	none..	....	cent..	Pierce...	motor.
Maccar.....U	5½	.....	186	Prsh..	p-stl	rigid.	s....	37x5s	37x5d	wd.	.....	.....	.....	.....	own.	fin-cst...	sing..	Bosch.	hand.	.....	.....	....	.....	.....	.....
Mack.....AB	1	2,400	144*	.....	p-stl	s-flx.	s....	36x4s	36x3½d	wd.	own.	4-4 x5 -25.6	2	cent...	own.	cel-sht..	sing.	Spltf..	hand.	opt...	opt....	....	cent..	own....	motor.
Mack.....AB	1	2,400	144*	.....	p-stl	s-flx.	s....	36x4s	36x3½d	wd.	own.	4-4 x5 -25.6	2	cent...	own.	cel-sht..	sing.	Spltf..	hand.	opt...	opt....	....	cent..	own....	motor.
Mack.....AB	1½	2,800	162*	.....	p-stl	s-flx.	s....	36x4s	36x3½d	wd.	own.	4-4 x5 -25.6	2	cent...	own.	cel-sht..	sing.	Spltf..	hand.	opt...	opt....	....	cent..	own....	motor.
Mack.....AB	1½	2,800	162*	.....	p-stl	s-flx.	s....	36x4s	36x3½d	wd.	own.	4-4 x5 -25.6	2	cent...	own.	cel-sht..	sing.	Spltf..	hand.	opt...	opt....	....	cent..	own....	motor.
Mack.....AB	2	3,000	162*	.....	p-stl	s-flx.	s....	36x4s	36x4d	wd.	own.	4-4 x5 -25.6	2	cent...	own.	cel-sht..	sing.	Spltf..	hand.	opt...	opt....	....	cent..	own....	motor.
Mack.....AB	2	3,000	162*	.....	p-stl	s-flx.	s....	36x4s	36x4d	wd.	own.	4-4 x5 -25.6	2	cent...	own.	cel-sht..	sing.	Spltf..	hand.	opt...	opt....	....	cent..	own....	motor.
Mack.....AC	3½	4,250	180*	.....	p-stl	s-flx.	s....	36x5s	40x5d	wd.	own.	4-5 x6 -40.0	2	cent...	own.	rng-cst..	.....	Spltf..	hand.	opt...	opt....	....	cent..	own....	motor.
Mack Tractor.....AB	5	3,100	120	.....	p-stl	s-flx.	s....	36x4s	36x4d	wd.	own.	4-4 x5 -25.6	2	cent...	own.	cel-sht..	sing.	Spltf..	hand.	opt...	opt....	....	cent..	own....	motor.
Mack.....AC	5½	4,750	180*	.....	p-stl	s-flx.	s....	36x6s	40x6d	wd.	own.	4-5 x6 -40.0	2	cent...	own.	rng-cst..	.....	Spltf..	hand.	opt...	opt....	....	cent..	own....	motor.
Mack Tractor.....AC	7	4,250	119	.....	p-stl	s-flx.	s....	36x5s	40x5d	wd.	own.	4-5 x6 -40.0	2	cent...	own.	rng-cst..	.....	Spltf..	hand.	opt...	opt....	....	cent..	own....	motor.
Mack.....AC	7½	5,000	180*	.....	p-stl	s-flx.	s....	36x7s	40x7d	wd.	own.	4-5 x6 -40.0	2	cent...	own.	rng-cst..	.....	Spltf..	hand.	opt...	opt....	....	cent..	own....	motor.
Mack Tractor.....AC	11	4,750	119	.....	p-stl	s-flx.	s....	36x6s	40x6d	wd.	own.	4-5 x6 -40.0	2	cent...	own.	rng-cst..	.....	Spltf..	hand.	opt...	opt....	....	cent..	own....	motor.
Mack Tractor.....AC	15	5,000	119	.....	p-stl	s-flx.	s....	36x7s	40x7d	wd.	own.	4-5 x6 -40.0	2	cent...	own.	rng-cst..	.....	Spltf..	hand.	opt...	opt....	....	cent..	own....	motor.
Manly.....30	1½	2,050	156	.....	p-stl	flex..	s....	36x4s	36x5s	wd.	.....	4-3½x5½-22.5	4	cent...	.....	p-t-ci...	sing.	Eismn	hand.	s&l...	opt....	....	cent..	.....	motor.
Manly.....40	2	2,250	156	.....	p-stl	flex..	s....	36x4s	36x6s	wd.	.....	4-3½x5½-22.5	4	cent...	.....	p-t-ci...	sing.	Eismn	hand.	s&l...	opt....	....	cent..	.....	motor.
Manly.....50	2½	2,600	168	.....	p-stl	flex..	s....	36x4s	40x7s	wd.	.....	4-4 x5½-25.6	2	cent...	.....	p-t-ci...	sing.	Eismn	hand.	s&l...	opt....	....	cent..	.....	motor.
Manly.....60	3	3,000	168	.....	p-stl	flex..	s....	36x5s	40x8s	wd.	.....	4-4½x5½-28.9	2	cent...	.....	p-t-ci...	sing.	Eismn	hand.	s&l...	opt....	....	cent..	.....	motor.
Master.....M	2	1,990	144	.....	.....	.....	s....	34x4	36x6	....	Bud.	4-4½x5½-28.9	4	.....	.....	.....	sing.	Eismn	fix...	.....	.....	....	suct..	Mnrch..	.....
Master	3½	2,990	160*	.....	.....	.....	.....	36x5	40x5	....	Bud.	4-4½x5½-27.2	....	.....	.....	.....	.....	Eismn	.....	.....	.....	....	.....	.....	.....
Maxfer	1	1,195	130	.....	pnu*	.....	.....	36x4	34x4	....	.....	4-3½x5 -19.6	....	ther...	.....	.....	.....	.....	.....	s&l...	Delco	....	.....	.....	.....
Maxwell	1	865	124	Hyd..	p-stl	s-flx.	s....	32x3s	32x4s	wd.	own.	4-3½x4½-21.0	4	ther...	own.	fin-p-s..	sing.	A-K..	hand.	ltg....	A-L...	none	suct.	none....	motor.
Menominee.....EW	¾	1,425	124	.....	rol-c	s-flx.	.....	34x3½s	34x4s	wd.	Con.	4-3½x5 -22.5	4	ther...	Long	fin-p-s..	sing.	Eismn	hand.	.....	.....	....	cent..	own....	d-s....
Menominee.....FW	1	1,790	130	.....	rol-c	s-flx.	s....	36x3½s	36x4s	wd.	Con.	4-3½x5½-22.5	4	cent...	Long.	fin-p-s..	sing.	Eismn	hand.	.....	.....	....	cent..	own....	.....
Menominee.....H	1½	2,050	144	.....	rol-c	s-flx.	s....	36x3½s	36x5s	wd.	Con.	4-3½x5½-22.5	4	cent...	Long.	fin-p-s..	sing.	Eismn	hand.	.....	.....	....	l-b..	own....	d-s....
Menominee.....D	2	2,475	144	.....	rol-c	s-flx.	s....	36x4s	36x6*	wd.	Con.	4-4½x5½-27.2	2	cent...	R-T..	fin-cst...	sing.	Eismn	hand.	.....	.....	....	cent..	own....	d-s....
Menominee.....G	3½	3,275	160	.....	rol-c	s-flx.	s....	36x5s	36x5d	wd.	Con.	4-4½x5½-32.4	2	cent...	R-T..	fin-cst...	sing.	Eismn	hand.	.....	.....	....	cent..	own....	.....
Modern.....36	.....	1,800	132	.....	p-stl	s-flx.	s....	34x3½s	34x5s	wd.	Con.	4-3¾x5 -22.5	4	cent...	Long.	fin-cst...	dual.	opt...	fix...	none.	none....	....	opt..	opt....	opt...
Moreland	1	1,900	126	.....	p-stl	s-flx.	s....	34x3½s	34x4s	wd.	Con.	4-3¾x5 -22.5	4	ther...	own.	cel-sht...	sing..	Dixie..	hand.	opt...	West.	....	none	none....	.....

ABBREVIATIONS—Types of Construction

*Other Options
amid—amidships
auto—automatic
c—center
c&l—center and left
c-s—cast steel
cent—centrifugal
cel-cst—cellular core cast case
cel-sht—cellular core sheet case
cylinders cast, 2 in pairs
cylinders cast, 4 in block
cylinders cast, 3 in threes
cylinders cast, 1 singly
d—dual
d-d—dry disk
d-p—dry plate
d-rd—double reduction
elec—electric
ext-dst—external drive-shaft
ext-f-s—external front wheels.
ext-jst—external jack-shaft
ext-r-w—external rear wheel
fab—fabric
fin-sht—finned tube core sheet case
flx—fixed
flex—flexible
fric—friction
gset—gearset
grav—gravity
hyd—hydraulic
ind-c—individual clutch
in-g—internal gear
in-g-4—internal gear drive on 4 wheels
int-dst—internal drive-shaft
int-f-w—internal front wheels.
int-r-w—internal rear wheel
jst—unit with jackshaft
l—left
ltg—lighting
metl—metal
mtr—unit with motor
opt—optional
pist—piston pump
plan—planetary
pnu—pneumatic
pres—pressure
prog—progressive sliding gear
p-stl—pressed steel
r—right
r-a—unit with rear axle
ring-cst—ring core cast case
rol-c—rolled channel
rol-i—rolled I-beam
r-rd—radius rods
selec—selective sliding gear
s-flx—semi-flexible
s & l—starting and lighting
s, l & i—starting, lighting and ignition
s, l & i 2—starting, lighting and ignition two-unit
sing—single
s—solid
spgs—springs
sq-t-sht—square tube core sheet case
stk—stock
sub-f—sub-frame
ther—thermo-syphon
tor-a—torque arm
tor-t—torsion tube
vacm—vacuum
wd—wood
w-d—multiple disk in oil
worm—top worm
w-p—wet plate
zz-t-sht—zig-zag tube core sheet case

Prices are exclusive of the 3 per cent. Government war tax

Commercial Vehicles for 1918—Continued

ENGINE				TRANSMISSION												BRAKES		CONTROL			UNIVERSALS		
SPEED		FUEL SYS.		CLUTCH		GEARSET				FINAL DRIVE								STEERING GEAR					
Motor in R.p.m.	Truck in M.p.h.	Carburetor, Make	Fuel Feed	Type	Make	Type	Make	Placed	Speeds	Type	Axle Make	Total Gear Reduction	Propulsion Taken By	Torque Taken By	Springs, Make	Foot	Hand	Placed	Make	Levers	Type	Make	Name and Model
1,060	22	Stmbg..	vacm..	cone..	Warner	selec...	Warner	mtr...	3	bevel..	own....	4.58	spgs...	spgs...	.....	ext-r-w.	ext-r-w.	.....	Jacx..	.....	.....	.....	Kissel
1,100	17	Stmbg..	vacm..	d-p...	Warner	selec...	Warner	mtr...	3	worm.	Shel...	6.5	spgs...	spgs...	.....	int-r-w.	int-r-w.	.....	Jacx..	.....	.....	.....	Kissel
1,190	15	Stmbg..	vacm..	d-p...	B-Beck.	selec...	Muncie	mtr...	4	worm.	Timkn.	8.5	spgs...	spgs...	.....	int-r-w.	int-r-w.	.....	Lavn..	.....	.....	.....	Kissel
1,245	13	Stmbg..	vacm..	d-p...	Warner	selec...	Warner	mtr...	4	worm.	Shel...	10.3	spgs...	spgs...	.....	int-r-w.	int-r-w.	.....	Ross..	.....	.....	.....	Kissel
1,300	20	opt....	grav*..	d-d...	B-Lipe.	selec...	B-Lipe	mtr...	3	worm.	Timkn.	6.7	spgs...	spgs...	Betts..	int-r-w.	int-r-w.	r....	Ross..	c....	.....	.....	Kleiber.....AA
1,250	18	opt....	grav*..	m-d..	H-Shaw	selec...	B-Lipe.	amid..	3	worm.	Shel...	7.75	spgs...	spgs...	Betts..	int-r-w.	int-r-w.	r....	Ross..	c....	.....	.....	Kleiber.....A
1,250	16	opt....	grav*..	m-d..	H-Shaw	selec...	B-Lipe.	amid..	3	worm.	Timkn.	8.5	spgs...	spgs...	Betts..	int-....	int-....	r....	Ross..	c....	.....	.....	Kleiber.....BB
1,200	14	opt....	grav*..	m-d..	H-Shaw	selec...	B-Lipe.	amid..	3	worm.	Shel...	8.75	spgs...	spgs...	Betts..	int-....	int-....	r....	Ross..	c....	.....	.....	Kleiber.....B
1,200	12	opt....	grav*..	m-d..	H-Shaw	selec...	B-Lipe.	amid..	4	worm.	Timkn.	10.33	spgs...	spgs...	Betts..	int-....	int-....	r....	Ross..	c....	.....	.....	Kleiber.....C
1,150	10	opt....	grav*..	m-d..	H-Shaw	selec...	B-Lipe.	amid..	4	worm.	Timkn.	11.66	spgs...	spgs...	Betts..	int-....	int-....	r....	Ross..	c....	.....	.....	Kleiber.....D
.....	.....	Zenith..	vacm..	d-p...	own....	selec...	own....	jsh...	3	chn...	Timkn.	9.6	r-rd....	.....	Iron...	int-r-w	ext-j-s.	l....	Ross..	c....	Metl..	K-B..	Knox.....35
.....	.....	Zenith..	vacm..	d-p...	own....	selec...	own....	jsh...	3	chn...	Timkn.	12.0	r-rd....	.....	Iron...	int-r-w	ext-j-s.	l....	Ross..	c....	Metl..	K-B..	Knox.....36
1,400	20	Stmbg..	grav..	d-d...	M&M..	selec...	M&M..	mtr...	3	in-g...	Torb...	7.0	spgs...	spgs...	.....	int-r-w.	ext-r-w.	l....	own...	c....	Metl..	K-B..	Koehler.....K
1,400	20	Stmbg..	grav..	d-d...	M&M..	selec...	M&M..	mtr...	3	in-g...	Torb...	7.0	spgs...	spgs...	.....	int-r-w.	ext-r-w.	l....	own...	c....	Metl..	K-B..	Koehler Tractor....KT
1,500	.....	Schblr..	grav..	.....	own...	frie...	.....	chn...	.....	.....	.....	.....	r-rd....	.....	.....	int-....	ext-....	.....	Jacx..	.....	.....	.....	Lambert.....V2
1,200	16	Stmbg..	vacm..	d-p...	B-Beck.	id-e....	Cotta..	mtr...	3	worm.	Shel...	7.7	spgs...	spgs...	.....	int-r-w.	ext-r-w.	.....	Ross..	.....	.....	.....	Lamson
1,200	14	Stmbg..	vacm..	d-p...	B-Beck.	id-e....	Cotta..	mtr...	3	worm.	Shel...	.....	spgs...	spgs...	.....	int-r-w.	int-r-w.	.....	Ross..	.....	.....	.....	Lamson
1,200	12	Stmbg..	vacm..	d-p...	B-Beck.	id-e....	Cotta..	amid..	3	worm.	Shel...	11.7	spgs...	spgs...	.....	int-r-w.	int-r-w.	.....	Ross..	.....	.....	.....	Lamson
1,200	10	Stmbg..	vacm..	d-p...	B-Beck.	id-e....	Cotta..	amid..	3	worm.	Shel...	11.7	spgs...	spgs...	.....	int-r-w.	int-r-w.	.....	Ross..	.....	.....	.....	Lamson
1,200	18	Stmbg..	vacm..	d-d...	B-Beck.	selec...	Fuller..	mtr...	3	worm.	Wis....	7.2	spgs...	spgs...	Kal....	int-r-w.	ext-f-w	l....	Lavn..	c....	Metl..	Acme..	Lane.....F
1,200	18	Stmbg..	vacm..	d-p...	B-Beck.	selec...	Covert.	amid..	3	worm.	Timkn.	7.75	spgs...	spgs...	Kal....	int-r-w.	int-r-w.	l....	Lavn..	c....	Metl..	Acme..	Lane.....B
1,200	12	Stmbg..	vacm..	d-p...	B-Beck.	selec...	Covert.	amid..	3	worm.	Shel...	8.75	spgs...	spgs...	Kal....	int-r-w.	int-r-w.	l....	Lavn..	c....	Metl..	Acme..	Lane.....C
1,250	15	Stmbg.	grav..	m-d..	M-Evn.	.....	Cotta..	amid..	3	chn...	.....	9.2	r-rd....	.....	Std....	int-r-w	ext-d-s.	l....	Gem...	c....	.....	.....	Lange.....C
1,250	15	Stmbg..	grav..	m-d..	M-Evn.	.....	Cotta..	amid..	3	chn...	.....	9.2	r-rd....	.....	Std....	int-r-w	ext-d-s.	l....	.....	c....	.....	.....	Lange.....B
1,000	12	Stewrt..	grav..	d-d...	Fuller..	selec...	Fuller..	mtr...	3	in-g...	Torb...	10.0	spgs...	spgs...	Ligt....	int-r-w	ext-r-w.	l....	Ross..	c....	.....	.....	Lapeer.....A
1,000	8	Stewrt..	grav..	d-d...	Fuller..	selec...	Fuller..	mtr...	3	in-g...	Torb...	13.0	spgs...	spgs...	Ligt....	int-r-w	ext-r-w.	l....	Ross..	c....	.....	.....	Lapeer.....C
1,400	18	Schblr..	grav..	d-d...	Fuller..	selec...	Fuller..	mtr...	3	worm.	Shel...	6.5	spgs...	spgs...	Merl....	int-r-w	int-r-w.	l....	Lavn..	c....	Metl..	Univ...	Larrabee.....M
1,200	15	Schblr..	grav..	d-d...	Fuller..	selec...	Fuller..	mtr...	3	worm.	Shel...	7.75	spgs...	spgs...	Merl....	int-r-w	int-r-w.	l....	Lavn..	c....	Metl..	Univ...	Larrabee.....N
1,200	14	Schblr..	grav..	d-d...	Fuller..	selec...	Fuller..	mtr...	3	worm.	Shel...	8.75	spgs...	spgs...	Merl....	int-r-w	int-r-w.	l....	Lavn..	c....	Metl..	Univ...	Larrabee.....O
1,200	17	Schblr..	grav..	d-d...	Muncie	selec...	Muncie	mtr...	4	worm.	Shel...	11.5	spgs...	spgs...	Merl....	int-r-w	int-r-w.	l....	Lavn..	c....	Metl..	Univ...	Larrabee.....R
.....	.....	Schblr..	grav..	.....	G-Lees.	selec...	G-Lees.	mtr...	3	bevel..	Pree...	4.3	spgs...	spgs...	.....	int-....	ext-....	.....	.....	.....	.....	.....	Lawson.....35
1,500	25	Zenith..	grav..	cone..	own....	selec...	Covert.	amid..	3	worm.	Timkn.	5.8	spgs...	spgs...	Mthr...	int-r-w.	int-r-w.	l....	Jacx..	c....	Metl..	Spicer.	Lippard-Stewart....MW
1,200	20	Zenith..	grav..	cone..	Hart....	selec...	B-Lipe.	amid..	3	worm.	Timkn.	6.0	spgs...	spgs...	Mthr...	int-r-w.	int-r-w.	l....	Ross..	c....	Metl..	Spicer.	Lippard-Stewart.....W
1,180	18	Zenith..	grav..	cone..	Hart....	selec...	B-Lipe.	amid..	3	worm.	Timkn.	7.0	spgs...	spgs...	Mthr...	int-r-w.	int-r-w.	l....	Ross..	c....	Metl..	Spicer.	Lippard-Stewart....HW
1,300	18	Zenith..	grav..	cone..	Hart....	selec...	B-Lipe.	amid.	3	worm.	Timkn.	7.75	spgs...	spgs...	Mthr...	int-r-w.	int.....	l....	Ross..	c....	Metl..	Spicer.	Lippard-Stewart.....F
1,295	15	Zenith..	grav..	cone..	Hart....	selec...	B-Lipe.	amid.	3	worm.	Timkn.	9.2	spgs...	spgs...	Mthr...	int-r-w.	int-....	l....	Ross..	c....	Metl..	Spicer.	Lippard-Stewart.....G
.....	.....	Schblr..	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	3	worm.	Timkn.	6.0	spgs...	spgs...	.....	int-r-w.	int-r-w.	.....	Jacx..	.....	.....	.....	Little Giant.....15
.....	.....	Schblr..	grav..	dsk...	B-Lipe.	.....	B-Lipe.	jst....	3	chn...	Timkn.	6.8	r-rd....	.....	.....	ext-....	ext-....	.....	Jacx..	.....	.....	.....	Little Giant.....H
.....	.....	Schblr..	grav..	dsk...	Hoosir..	selec...	Covert.	jst....	3	chn...	Russl..	6.8	r-rd....	.....	.....	ext-r-w.	ext-j-s.	.....	Jacx..	.....	.....	.....	Little Giant.....H
.....	.....	Schblr..	grav..	d-d...	B-Lipe.	selec...	.....	mtr...	3	worm.	.....	7.7	spgs...	spgs...	.....	int-r-w.	int-r-w.	.....	Ross..	.....	.....	.....	Little Giant.....16
1,100	15	Stmbg..	vacm..	d-d...	.....	selec...	.....	mtr...	3	in-g...	.....	.....	.....	spgs...	Shel...	ext-r-w.	int-....	l....	Lavn..	c....	.....	.....	Lumb.....C
1,000	16	Stmbg..	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	3	worm.	Timkn.	7.0	r-rd....	spgs...	Merl....	int-r-w.	int-r-w.	l....	Ross..	c....	Metl..	Spicer.	Maccar.....L
1,000	15	Stmbg..	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	3	worm.	Timkn.	7.75	r-rd....	spgs...	Merl....	int-....	int-....	l....	Ross..	c....	Metl..	Spicer.	Maccar.....H
1,000	14	Stmbg..	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	3	worm.	Timkn.	10.3	r-rd....	spgs...	Merl....	int-r-w.	int-....	l....	Ross..	c....	Metl..	Spicer.	Maccar.....M
.....	.....	.....	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Timkn.	11.5	r-rd....	spgs...	Merl....	int-r-w.	int-r-w.	l....	Ross..	c....	Metl..	Spicer.	Maccar.....U
1,275	.....	Stmbg*	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	4	worm.	Timkn.	7.75	spgs...	spgs...	Mthr...	int-r-w.	int-r-w.	l....	Gem...	c....	.....	.....	Mack.....AB
1,275	.....	opt....	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	4	chn...	own....	6.29	r-rd....	.....	Mthr...	int-r-w.	int-d-s.	l....	Gem...	c....	.....	.....	Mack.....AB
1,275	.....	Stmbg*	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	4	worm.	Timkn.	8.5	spgs...	spgs...	Mthr...	int-r-w.	int-r-w.	l....	Gem...	c....	.....	.....	Mack.....AB
1,275	.....	Stmbg*	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	4	chn...	Timkn.	6.99	r-rd....	.....	Mthr...	int-r-w.	ext-d-s.	l....	Gem...	c....	.....	.....	Mack.....AB
1,275	.....	Stmbg*	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	4	worm.	Timkn.	8.5	spgs...	spgs...	Mthr...	int-r-w.	int-r-w.	l....	Gem...	c....	.....	.....	Mack.....AB
1,275	.....	Stmbg*	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	4	chn...	own....	6.99	r-rd....	.....	Mthr...	int-r-w.	ext-d-s.	l....	Gem...	c....	.....	.....	Mack.....AB
1,000	.....	Stmbg*	grav..	d-p...	own....	selec...	own....	amid..	3	chn...	own....	7.45	r-rd....	.....	Mthr...	int-r-w.	ext-j-s.	l....	Gem...	c....	.....	.....	Mack.....AC
1,275	.....	Stmbg*	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	4	chn...	own....	10.5	r-rd....	.....	Mthr...	int-r-w.	ext-d-s.	l....	Gem...	c....	.....	.....	Mack Tractor.....AB
1,000	.....	Stmbg*	grav..	d-p...	own....	selec...	own....	amid..	3	chn...	own....	8.4	r-rd....	.....	Mthr...	int-r-w.	ext-j-s.	l....	Gem...	c....	.....	.....	Mack.....AC
1,000	.....	Stmbg*	grav..	d-p...	own....	selec...	own....	amid..	3	chn...	own....	10.77	r-rd....	.....	Mthr...	int-r-w.	ext-j-s.	l....	Gem...	c....	.....	.....	Mack Tractor.....AC
1,000	.....	Stmbg*	grav..	d-p...	own....	selec...	own....	amid..	3	chn...	own....	11.58	r-rd....	.....	Mthr...	int-r-w.	ext-j-s.	l....	Gem...	c....	.....	.....	Mack.....AC
1,000	.....	Stmbg*	grav..	d-p...	own....	selec...	own....	amid..	3	chn...	own....	11.5	r-rd....	.....	Mthr...	int-r-w.	ext-j-s.	l....	Gem...	c....	.....	.....	Mack Tractor.....AC
1,000	.....	Stmbg*	grav..	d-p...	own....	selec...	own....	amid..	3	chn...	own....	14.1	r-rd....	.....	Mthr...	int-r-w.	ext-j-s.	l....	Gem...	c....	.....	.....	Mack Tractor.....AC
1,125	16	Zenith..	vacm..	d-d...	.....	selec...	.....	mtr...	3	worm.	.....	7.5	r-rd....	tor-a...	.....	int-r-w.	ext-r-w.	l....	.....	c....	.....	.....	Manly.....30
1,225	15	Zenith..	vacm..	d-d...	.....	selec...	.....	mtr...	3	worm.	.....	8.7	r-rd....	tor-a...	.....	int-r-w.	ext-r-w.	l....	.....	c....	.....	.....	Manly.....40
1,020	14	Zenith..	vacm..	d-d...	.....	selec...	.....	mtr...	4	worm.	.....	8.75	r-rd....	tor-a...	.....	int-r-w.	int-r-w.	l....	.....	c....	.....	.....	Manly.....50
950	13	Zenith..	vacm..	d-d...	.....	selec...	.....	mtr...	4	worm.	.....	8.75	r-rd....	tor-a...	.....	int-r-w.	int-r-w.	l....	.....	c....	.....	.....	Manly.....60
.....	15	Master.	pres...	d-d...	Fuller..	selec...	Fuller..	mtr...	3	in-g...	Torb...	8.0	spgs...	spgs...	Dtrt....	int-r-w.	ext-r-w.	l....	Lavn..	c....	.....	.....	Master.....M
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Master
.....	.....	.....	cone..	.....	.....	selec...	.....	mtr...	.....	.....	.....	.....	spgs...	spgs...	.....	int-r-w.	ext-r-w.	.....	.....	.....	.....	.....	Maxfer
1,540	20	K-D....	grav..	cone..	own....	selec...	own....	mtr...	3	worm.	own....	7.25	spgs...	spgs...	.....	int-r-w.	int-r-w.	l....	own...	c....	block...	own....	Maxwell
900	25	Stmbg..	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	3	worm.	Timkn.	6.0	r-rd....	spgs...	Tut....	int-r-w.	int-r-w.	l....	Gem...	c....	.....	.....	Menominee.....EW
850	16	Stmbg..	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	3	worm.	Timkn.	8.75	r-rd....	spgs...	Tut....	int-r-w.	int-r-w.	l....	Gem...	c....	.....	.....	Menominee.....FW
800	15	Stmbg..	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	3	worm.	Timkn.	9.25	r-rd....	spgs...	Tut....	int-r-w.	int-r-w.	l....	Gem...	c....	.....	.....	Menominee.....H
750	14	Stmbg..	grav..	d-p...	B-Beck.	selec...	B-Lipe.	mtr...	3	worm.	Timkn.	9.25	r-rd....	spgs...	Tut....	int-r-w.	int-r-w.	l....	Gem...	c....	.....	.....	Menominee.....D
750	12	Stmbg..	grav..	d-p...	B-Beck.	selec...	Cotta..	amid..	3	worm.	Timkn.	10.3	r-rd....	spgs...	Tut....	int-r-w.	int-r-w.	l....	Gem...	c....	.....	.....	Menominee.....G
.....	.....	Zenith..	vacm..	d-d...	Fuller..	selec...	Fuller..	mtr...	3	worm.	Timkn.	.....	r-rd....	spgs...	Perf...	ext-r-w.	ext-r-w.	r....	Ross..	c....	.....	.....	Modern.....30
.....	.....	Mastr*.	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	3	worm.	Timkn.	6.0	spgs...	spgs...	own....	int-r-w.	int-r-w.	.....	Ross..	c....	.....	.....	Moreland

ABBREVIATIONS—Makers of Parts

*Other Options
A-K—Atwater-Kent
Aut-L—Auto-Lite
B-Beck—Borg & Beck
B-Lipe—Brown-Lipe
Bing—Berling
Brm—Bremer
Bud—Buda
Can—Candler
Celfr—Celfor
Chgo—Chicago
Con—Continental
Conn—Connecticut
Dtrt—Detroit
Dynt—Dyneto
Elsmn—Elsemann
E-M—English & Mersick
Eur—Eureka
Fed—Fedders
Franck—Francke
G&O—G & O Mfg. Co.
GBS—Golden, Belknap & Swartz
G-C—Garden City
Gem—Gemmer
Har—Harrison
Hart—Hartford
Hays—Hayes
Hig—Higgins
H-Shaw—Hele-Shaw
H-S—Herschell-Spillman
Idl—Ideal
Iron—Iron City
Jacx—Jackson-Church-Wilcox
Jhnson—Johnson
Kal—Kalamazoo
K-B—Kinsler-Bennett
Key-H—Keystone-Hindley
Lavn—Lavigne
LeR—LeRoi
Lgt—Light
Ligt—Liggett
Lyc—Lycoming
M'C—McCord
Merl—Merrill
Mil—Milwaukee
Mnrch—Monarch
Mthr—Mather
Natl—National
N. A.—North American
P & B—Parish & Bingham
Perf—Perfection
Prsh—Parish
R-T—Rome-Turney
Rayfld—Rayfield
Rowl—Wm. Harvey Rowland
Russl—Russel
Rut—Rutenber
Savg—Savage Arms
Salsby—Salisbury
Schblr—Schebler
Shel—Sheldon
Shkspr—Shakespeare
Smth—A. O. Smith
S-P—Spring-Perch
Spltf—Splitdorf
Stewrt—Stewart
Stmbg—Stromberg
Sundmn—Sunderman
S-W—Sparks Withington
Ther—Thermoid
Timkn—Timken
Torb—Torbenson
Tut—Tuthill
Univ—Universal Machine Co.
Wau—Waukesha
Wilcx—Wilcox
Wis—Wisconsin

Prices are exclusive of the 3 per cent Government war tax

Technical Specifications of Gasoline

Name and Model	Tons Capacity	Chassis Price	Wheelbase, Inches	FRAME			TIRES			Wheels	ENGINE														
								Sizes in Ins.						COOLING			IGNITION			ELEC. SYSTEM			GOVERNOR		
				Make	Material	Type	Kind	Front	Rear		Make	No. Cyl. Bore and Stroke—N.A.C.C., Hp.	Cylinders Cast	Water Circ.	Radiator Make	Radiator Core and Case	Type	Make	Spark Advance	Type	Make	Extra Cost	Type	Make	Drive
Moreland	1½		106		p-stl.	s-flx.	s.	36x3½s	36x5s	c-s.	Con.	4-4½x5½-27.2	4	cent.	own.	cel-sht.	sing.	Dixie.	hand.	opt.	West.		cent.	Pierce.	motor.
Moreland	2½	3,000	144		p-stl.	s-flx.	s.	36x4s	36x7s	c-s.	Con.	4-4½x5½-32.4	2	cent.	own.	cel-sht.	dual.	Dixie.	hand.	opt.	West.			Pierce.	motor.
Moreland	4	3,800	162		p-stl.	s-flx.	s.	36x5s	40x5d	c-s.	Wau.	4-4½x6½-36.1	2	cent.	own.	cel-sht.	dual.	Dixie.	hand.	opt.	West.		cent.	Wau.	
Moreland	5	4,500			p-stl.		s.	36x6s	40x6d	c-s.	Wau.	4-4½x6½-36.1	2	cent.	own.	cel-sht.	dual.	Dixie.	hand.	opt.	West.		cent.	Wau.	
Muskegon	20	2,200	144	P&B.	p-stl.	s-flx.	s.	36x4	36x6	wd.	Con.	4-4½x5½-27.2	4	cent.	own.	cel-sht.	sing.	Eismn	fix.	ltg*		opt.	cent.	Pierce.	motor.
Nash	2017	1,495	130	Smth.	p-stl.	flex.	s*	34x3	34x4	wd.	own.	4-3½x5½-22.5	4	cent.	M'C.	fin-cst.	sing.	Delco	hand.	sl&i2.	Bijur.	stk.	cent.	Simplex	motor.
Nash	4017	3,250	124	Smth.	p-stl.	flex.	s.	36x5	36x5	c-s.	Bud.	4-4½x5½-28.9	4	cent.	M'C.	fin-cst.	sing.	Eismn	hand.	s&l2.	Bijur.	125	cent.	Duplex.	duplx.
Nelson & LeMoon	E	1,900	opt.		rol-c.	s-flx.	s.	36x3½	36x5	wd.	Con.	4-4½x5½-22.5	4	cent.	Chg.	zz-t-ps.	sing.	Bosch.	hand.	sl&i.	West.	125	suct.	Mnrch.	motor.
Nelson & LeMoon	E	2,250	opt.		rol-c.	s-flx.	s.	36x4	36x7	wd.	Con.	4-4½x5½-27.2	4	cent.	Chg.	zz-t-ps.	dual.	Bosch.	hand.	sl&i.	West.	125	suct.	Mnrch.	motor.
Nelson & LeMoon	E	2,950	opt.		rol-c.	s-flx.	s.	36x5	38x5d	wd.	Con.	4-4½x5½-32.4	2	cent.	Chg.	zz-t-ps.	dual.	Bosch.	hand.	sl&i.	West.	125	suct.	Mnrch.	motor.
Nelson & LeMoon		3,750	opt.		rol-c.	s-flx.	s.	36x6	40x6d	wd.	Bud.	4-4½x6 -32.4	4	cent.	Chg.	zz-t-ps.	dual.	Bosch.	hand.	sl&i.	West.	125	suct.	Mnrch.	motor.
Netco	D	2,500	144	Prsh.	p-stl.	rigid.	s.	36x4	36x6	wd.	Con.	4-4½x5½-27.2	4	cent.	R-T.	fin-cst.	sing.	Eismn	fix.	none.	none.		none.	none.	
New York	M	2,200	144*				s.	36x3½	36x5			4-4½x5½-27.2	4				sing.	Bosch.	fix.				cent.	Pierce.	motor.
New York	N	2,600	144				s.	36x4	36x4d			4-4½x5½-27.2					sing.	Bosch.	fix.				cent.	Pierce.	motor.
Niles	B	1,500	124				pnu.	35x5	35x5		Con.	4-3½x5 -19.6	4	ther.			sing.	Eismn	hand.				cent.	Pierce.	motor.
Niles	E	2,400	140*				s.	36x4	36x7		Con.	4-4½x5½-27.2	4				sing.	Eismn	hand.				cent.	Pierce.	motor.
Noble	NW	2,300	148	Dtrt.	p-stl.			36x4	36x6		Con.	4-4½x5½-27.2						Eismn				35		Pierce.	
Old Hickory	M	875	112		rol-c.	flex.	pnu.	33x4	33x4	wd.	Lyc.	4-3½x5 -16.9	4	ther.	Can.	sq-t-ps.	sing.	Conn.	hand.	sl&i.	Dynt.	stk.	none.	none.	
Old Reliable		1,950	150*		p-stl.		s.	34x3½	36x6		Wis.	4-3½x5 -22.5	4				sing.	Bosch.	hand.	ltg.					
Old Reliable		2,450	150				s.	34x4	36x4d		Wis.	4-4 x6 -25.6	4				sing.	Bosch.	hand.	ltg.			cent.	Duplex.	duplx.
Old Reliable		2,750					s.	34x4	36x4d		Wis.	4-4½x5 -29.0	2				sing.	Bosch.	hand.						
Old Reliable		3,250	150				s.	34x5	36x5d		Wis.	4-4½x6 -29.0	4				sing.	Bosch.	hand.	ltg.			cent.	Duplex.	duplx.
Old Reliable		3,750					s.	36x5	40x5d		Wis.	4-4½x5½-36.2	2				sing.	Bosch.	hand.	ltg.			cent.	Duplex.	duplx.
Old Reliable		3,750					s.	36x6	36x6d		Wis.	4-4½x5½-36.2	2				sing.	Bosch.	hand.	ltg.					
Old Reliable		4,500	150*				s.	36x6	36x6d		Wis.	4-4½x5½-36.2	2				sing.	Bosch.	hand.	ltg.			cent.	Duplex.	duplx.
Old Reliable		5,000	150				s.	36x6	40x7d			4-5½x5½-41.6	2				sing.	Bosch.	hand.	ltg.			cent.	Duplex.	duplx.
Oneida	A	2,000	130	own.	rol-c.	s-flx.	s.	36x3½	36x5	wd.	Con.	4-3½x5½-22.5	4	cent.	Long.	fin-cst.	sing.	Bosch.	hand.	ltg.	Bosch.	stk.	cent.	Duplex.	motor.
Oneida	B	2,650	130	own.	rol-c.	s-flx.	s.	36x3½	36x5	wd.	Con.	4-4½x5½-27.23	4	cent.	Long.	fin-cst.	sing.	Bosch.	hand.	ltg.	Bosch.	stk.	cent.	Duplex.	motor.
Oneida	C	3,000	144	own.	rol-c.	s-flx.	s.	36x4	36x4d*	wd.	Con.	4-4½x5½-27.23	4	cent.	Long.	fin-cst.	sing.	Bosch.	hand.	ltg.	Bosch.	stk.	cent.	Duplex.	motor.
Oneida	D	3,600	160	own.	rol-c.	s-flx.	s.	36x5	36x5d	wd.	Con.	4-4½x5½-32.40	2	cent.	Long.	fin-cst.	sing.	Bosch.	hand.	ltg.	Bosch.	stk.	cent.	Duplex.	motor.
Overland		635	104		p-stl.	rigid.	pnu.	31x4	31x4	wd.	own.	4-3½x5 -18.23	4	ther.	own.	cel-ps.	sing.	opt.	hand.	sl&i 2.	A-L.	none	none	none.	
Overland		800	106		p-stl.	rigid.	pnu.	33x4½	33x4½	wd.	own.	4-4½x4½-27.23	4	ther.	own.	cel-ps.	sing.	opt.	hand.	sl&i 2.	A-L.	none	none	none.	
Packard	D	2,450	126*				s.	34x3½	34x6		own.	4-4 x5½-25.6	4				dual.	Dixie.	hand.	s&l.	Bijur.		cent.	own.	motor.
Packard	D	2,800	126*				s.	34x3½	34x3½d		own.	4-4 x5½-25.6	4				dual.	Dixie.	hand.	s&l.	Bijur.		cent.	own.	motor.
Packard	D	3,200	144*				s.	34x4	34x4d		own.	4-4 x5½-25.6	4				dual.	Dixie.	hand.	s&l.	Bijur.		cent.	own.	motor.
Packard	D	3,900	156*				s.	36x5	36x5d		own.	4-4½x5½-32.4	4				dual.	Dixie.	hand.	s&l.	Bijur.		cent.	own.	motor.
Packard	D	4,375	156*				s.	36x5	40x5d		own.	4-4½x5½-32.4	4				dual.	Dixie.	hand.	s&l.	Bijur.		cent.	own.	motor.
Packard		4,900					s.				Str.	4-5 x5½-40.0	4				dual.	Dixie.	hand.	s&l.	Bijur.		cent.	own.	motor.
Packard		5,100										4-5 x5½-40.0													
Packet		300	100		rol-l.	s-flx.	pnu.	28x3	28x3	wd.	own.	4-2½x4 -12.1	4	ther.	own.	zz-t-sh.	sing.	A-K.	auto.						
Palmer		1,585	132	P&B.	p-stl.		opt.	34x3½	34x4	wd.	Con.	4-3½x5 -22.50	4	cent.	Fed.	cel-cst.	dual.	Bosch.	fix.					Pierce.	motor.
Palmer		2,275	144	P&B.	p-stl.		s.	36x3½	36x4d*	wd.	Con.	4-4½x5½-27.23	4	cent.	Fed.	cel-cst.	dual.	Bosch.	fix.					Pierce.	motor.
Peerless	TC	3,000	145	own.	rol-c.	s-flx.	s.	36x4	36x4d	wd.	own.	4-4½x6½-32.4	2	gear.	own.	fin-cst.	dual.	Remy.	hand.	ltg 2.	G&D.		cent.	own.	motor.
Peerless	TC	3,700	151	own.	rol-c.	rigid.	s.	36x4	40x4d	wd.	own.	4-4½x6½-32.4	2	gear.	own.	fin-cst.	dual.	Remy.	hand.	ltg 2.	G&D.		cent.	own.	motor.
Peerless	TC	4,000	151	own.	rol-c.	rigid.	s.	36x5	40x5d	wd.	own.	4-4½x6½-32.4	2	gear.	own.	fin-cst.	dual.	Remy.	hand.	ltg 2.	G&D.		cent.	own.	motor.
Peerless	TC	5	4,500	151	own.	rol-c.	rigid.	s.	38x6	42x6d	wd.	own.	4-4½x6½-32.4	2	gear.	own.	fin-cst.	dual.	Remy.	hand.	ltg 2.	G&D.		cent.	own.	motor.
Peerless	TC	6	5,000	151	own.	rol-c.	s-flx.	s.	38x7	42x7d	wd.	own.	4-4½x6½-32.4	2	gear.	own.	fin-cst.	dual.	Remy.	hand.	ltg 2.	G&D.		cent.	own.	motor.
Pierce-Arrow		2	3,300	150	own.	p-stl.	flex.	s.	36x4	36x4d	wd.	own.	4-4 x5½-25.6	2	cent.	own.	fin-cst.	dual.	Eismn	hand.	s&l.	opt.		cent.	own.	motor.
Pierce-Arrow		5	5,000	168	own.	p-stl.	flex.	s.	36x5	40x6d	wd.	own.	4-4½x6 -38.0	2	cent.	own.	fin-cst.	dual.	Eismn	hand.	s&l.	opt.		cent.	own.	motor.
Pull-More		3	3,400	153				s.	36x6	36x6		Bud.	4-4½x6 -32.4	4												
Rainier	R	¼	895	115	P&B.	p-stl.	rigid.	pnu.	32x3½	32x3½	wd.	Lght.	4-3½x4½-16.9	4	ther.	Bush.	fin-ps.	sing.	Spltf.	hand.	2.	Bijur.*				
Rennoc-Leslie		2½	3,250	144	own.	p-stl.	s-flx.	s.	36x5	36x7	wd.	Bud.	4-4½x5½-27.2	4	cent.		fin-cst.	dual.	Spltf.	hand.	ltg.	West.	stk.	cent.	Pierce.	motor.
Rennoc-Leslie Tractor		3	3,250	116	own.	p-stl.	s-flx.	s.	36x5	36x7	wd.	Bud.	4-4½x5½-27.2	4	cent.		fin-cst.	dual.	Spltf.	hand.	ltg.	West.	stk.	cent.	Pierce.	motor.
Reo	F	¾	1,050	128	own.	p-stl.	rigid.	pnu.	34x4½	34x4½	wd.	own.	4-4½x4½-27.2	2	cent.	own.	fin-sht.	sing.	Remy.	hand.	sl&i 2.	Remy.	stk.	none.	none.	
Reo	J	2	1,800	146	own.	p-stl.	rigid.	s.	36x4	36x3½d	wd.	own.	4-4½x4½-27.2	2	cent.	own.	fin-cst.	dual.	Natl.	hand.	sl&i 2.	Remy.	180	hyd.	own.	motor.
Republic		½	895	110	Dtrt*	p-stl.	s-flx.	opt.	32x4*	32x4*	wd.	own.	4-3½x5 -16.9	4	ther.	own.	sq-t-c.	sing.	Remy.	fix.	stg.	Remy.	stk.	suct.	Ruggles.	motor.
Republic		½	895	128	Savg*	p-stl.	s-flx.	opt.	32x4½*	33x5*	wd.	own.	4-3½x5 -16.9	4	ther.	own.	sq-t-c.	sing.	Eismn	fix.				suct.	Ruggles.	motor.
Republic	10	1	1,195	124	Dtrt*	p-stl.	s-flx.	s.	34x3	34x4	wd.	Con.	4-3½x5 -19.6	4	ther.	own.	cel-cst.	sing.	Bosch.	fix.				suct.	Ruggles.	motor.
Republic	11	1½	1,450	144	Dtrt*	p-stl.	s-flx.	s.	34x3½	34x5	wd.	Con.	4-3½x5 -22.5	4	ther.	own.	cel-cst.	sing.	Bosch.	fix.				suct.	Ruggles.	motor.
Republic	A	2	1,885	144	Savg*	p-stl.	s-flx.	s.	34x4	34x6	wd.	Bud.	4-4½x5½-27.2	4	cent.	own.	cel-cst.	sing.	Bosch.	fix.				suct.	Ruggles.	motor.
Republic	T	3½	2,750	1 5	Savg*	p-stl.	s-flx.	s.	36x5	36x5d	c-s.	Bud.	4-4½x5½-29.0	4	cent.	own.	cel-cst.	sing.	Bosch.	hand.				suct.	Ruggles.	otor.
Republic	V	5	4,250	60		p-stl.	s-flx.	s.	36x5	40x6d	c-s.	Bud.	4-4½x6 -32.4	4	cent.	own.	cel-cst.	sing.	Bosch.	hand.				cent.	Duplex.	motor.
Reya	18	1	998	117		p-stl.	rigid.	pnu.	31x4	31x4	wd.	GBS.	4-3½x4½-22.5	4	ther.	Kunz	cel-ps.	dual.	Spltf.	hand.	sl&i 2.	Dynt.	stk.			
Riker	B	3	3,900	150	Prsh.	p-stl.	rigid.	s.	36x5	36x5d	wd*	own.	4-4½x6 -28.9	2	cent.	own.	fin-cst.	dual.	Bosch.	hand.	s&l 2.	West.	250	l-b.	own.	motor.
Riker	BB	4	4,050	150	Prsh.	p-stl.	rigid.	s.	36x5	36x6d	wd*	own.	4-4½x6 -28.9	2	cent.	own.	fin-cst.	dual.	Bosch.	hand.	s&l 2.	West.	250	l-b.	own.	motor.
Rowe	CDW	2	2,800	142	own.	rol-c.		s.	34x4	36x3½*	wd.		4-4 x5 -25.6	4	cent.				Bosch.							
Rowe	CDW	2½	3,000	164	own.	rol-c.		s.	34x4	36x4*	wd.		4-4 x5 -25.6	4	cent.				Bosch.							
Rowe	DEW	3½	3,400	156	own.	rol-c.		s.	36x5	36x5d	wd.		4-4 x6 -25.6	2	cent.				Bosch.							
Rowe	GW	5	4,500	171	own.	rol-c.		s.	36x6	36x6d	wd.		4 4½x5½-36.2	2	cent.				Bosch.							
Royal		1		124*				s.	34x4	34x5		Wis.	4-3½x5 -16.9	4				sing.	Bosch.	fix.				suct.	Mnrch.	motor.
Royal		2		132*				s.	36x4½	36x6		Wis.	4-4 x6 -25.6	4				sing.	Bosch.	fix.				suct.	Mnrch.	motor.
Royal		3½		158*				s.	36x5	38x5d		Wis.	4-4½x6 -29.0	4				sing.	Bosch.	fix.				suct.	Mnrch.	motor.

ABBREVIATIONS—Types of Construction

*Other Options
amid—amidships
auto—automatic
c—center
c&l—center and left
c-s—cast steel
cent—centrifugal
cel-cst—cellular core cast case
cel-sht—cellular core sheet case
cylinders cast, 2 in pairs
cylinders cast, 4 in block
cylinders cast, 3 in threes
cylinders cast, 1 singly
d—dual
d-d—dry disk
d-p—dry plate
d-rd—double reduction
elec—electric
ext-dst—external drive-shaft
ext-f-s—external front wheels.
ext-jst—external jack-shaft
ext-r-w—external rear wheel
fab—fabric
fin-sht—finned tube core sheet case
flx—fixed
flex—flexible
fric—friction
gset—gearset
grav—gravity
hyd—hydraulic
ind-c—individual clutch
int-dst—internal drive-shaft
int-f-w—internal front wheels
in-g—internal gear
in-g-4—internal gear drive on 4 wheels
int-r-w—internal rear wheel
jst—unit with jackshaft
l—left
ltg—lighting
metl—metal
mtr—unit with motor
opt—optional
plst—piston pump
plan—planetary
pnu—pneumatic
pres—pressure
prog—progressive sliding gear
p-stl—pressed steel
r—right
r-a—unit with rear axle
ring-cst—ring core cast case
rol-c—rolled channel
rol-l—rolled I-beam
r-rd—radius rods
selec—selective sliding gear
s-flx—semi-flexible
s & l—starting and lighting
s, l & i—starting, lighting and ignition
s, l & i 2—starting, lighting and ignition two-unit
sing—single
s—solid
spgs—springs
sq-t-sht—square tube core sheet case
stk—stock
sub-f—sub-frame
ther—thermo-syphon
tor-a—torque arm
tor-t—torsion tube
vacm—vacuum
wd—wood
w-d—multiple disk in oil
worm—top worm
w-p—wet plate
zz-t-sht—zig-zag tube core sheet case

Prices are exclusive of the 3 per cent. Government war tax

Commercial Vehicles for 1918—Continued

ENGINE				TRANSMISSION											BRAKES		CONTROL			UNIVERSALS		
SPEED		FUEL SYS.		CLUTCH		GEARSET				FINAL DRIVE							STEERING GEAR					
Motor in R. P. M.	Truck in M.p.h.	Carbureter Make	Fuel Feed	Type	Make	Type	Make	Placed	Speeds	Type	Axle Make	Total Gear Reduction	Propulsion Taken By	Torque Taken By	Make Springs	Foot	Hand	Placed	Make	Levers	Type	Make	Name and Model
1,280	18	Mastr*	grav	d-d	own	selec	own	amid	4	worm	Timkn	7.0	r-rd	spgs	own	int-r-w	int-r-w	l	Ross	c			Moreland
1,090	18	Mastr*	grav	d-d	own	selec	own	amid	4	worm	Timkn	6.8	r-rd	spgs	own	int-r-w	int-r-w	l	Ross	c			Moreland
		Mastr*	grav	d-d	B-Lipe	selec	B-Lipe	amid	4	worm	Timkn	7.8	r-rd	spgs	own	int-r-w	int-r-w	l	Ross	c			Moreland
		Mastr*	grav	d-d	B-Lipe	selec	B-Lipe	amid	4	worm	Timkn	10.25	r-rd	spgs	own	int-r-w	int-r-w	l	Ross	c			Moreland
1,230	16	Stewrt	grav	d-d	Fuller	selec	Fuller	mtr	3	in-g	Torb	8.0	spgs	spgs		int-r-w	ext-r-w	l	Lavn	c	metl	Arvac	Muskegon 20
1,345	20	Stmbg	grav	d-p	B-Beck	selec	Dtrt	mtr	3	in-g	Buch	6.8	spgs	spgs		ext-d-s	ext-r-w	l	Jacx	c		own	Nash 2017
1,191	15	Stmbg	grav	d-p	B-Beck	selec	own	amid	4	in-g	own	8.5	spgs	spgs	Mthr	ext-d-s	int-4-w	l	Lavn	c		own	Nash 4017
1,100	18	Stmbg	grav	d-d	B-Lipe	selec	B-Lipe	mtr	3	worm	Timkn	7.0	spgs	spgs	Tut	int-r-w	int-r-w	r	Lavn	c			Nelson & LeMoon E
1,100	18	Stmbg	grav	d-d	B-Lipe	selec	B-Lipe	mtr	3	worm	Timkn	7.0	spgs	spgs	Tut	int-r-w	int-r-w	r	Lavn	c			Nelson & LeMoon E
1,100	14	Stmbg	grav	d-d	B-Lipe	selec	B-Lipe	mtr	4	worm	Timkn	8.75	spgs	spgs	Tut	int-r-w	ext-r-w	r	Lavn	c			Nelson & LeMoon E
1,050	11	Stmbg	grav	d-d	B-Lipe	selec	B-Lipe	mtr	4	worm	Timkn	11.33	spgs	spgs	Tut	int-r-w	int-r-w	r	Lavn	c			Nelson & LeMoon
1,800		Zenith	grav	d-d	B-Lipe	selec	B-Lipe	mtr	3	worm	Timkn	8.5	spgs	spgs	Perf	int-r-w	int-r-w	l	Ross	c	metl	Hart	Netco D
1,400	18	Stmbg	grav	d-p		id-c		mtr	3	worm		7.7	r-rd	spgs		int-r-w	int-r-w						New York M
1,100	15	Stmbg	grav	d-p		id-c		mtr		worm			r-rd	spgs		int-r-w	int-r-w						New York N
1,573	25	Stmbg	grav	d-d	Covert	selec	Covert	mtr	3	worm	Timkn	6.5	spgs	spgs		int-r-w	int-r-w		Gem				Niles B
1,173	15	Stmbg	grav	d-p	B-Beck	selec	Covert	amid	3	worm	Timkn	8.5	r-rd	spgs		int-r-w	int-r-w		Gem				Niles E
1,300	16	Stmbg			B-Beck		Cotta		3	worm	Shel	8.75			Kal				Ross		metl	Blood	Noble NW
1,900	20	Carter	grav	cone	Lyc	selec	G-Lees	mtr	3	bevel	Salby	6.0	t-tb	t-tb	Tut	int-r-w	ext-r-w	l	CAS	c			Old Hickory M
		Stmbg	grav	d-d	B-Lipe	selec	B-Lipe	mtr	3	worm		7.7	spgs	spgs		int-r-w	int-r-w		Ross		metl	Spicer	Old Reliable
		Stmbg	grav	d-d	B-Lipe	selec	B-Lipe	mtr	3	worm	Shel	7.7	spgs	spgs		int-r-w	int-r-w		Ross		metl	Spicer	Old Reliable
		Stmbg	grav			selec	DSOC	jst	3	chn	SA&P		r-rd			int-r-w	ext-j-s		Ross		metl	Hart	Old Reliable
		Stmbg	grav	d-d		selec	B-Lipe	mtr	3	worm	Shel	8.7	spgs	spgs		int-r-w	int-r-w		Ross		metl	Spicer	Old Reliable
		Stmbg	grav	d-d		selec	B-Lipe	amid	4	worm	Shel	8.7	spgs	spgs		int-r-w	int-r-w		Ross		metl	Spicer	Old Reliable
		Stmbg	grav	d-d		selec		amid	3	chn	Shel		r-rd			ext-	int-		Ross		metl	Hart	Old Reliable
		Stmbg	grav	d-d	D-Seab	selec		amid	3	chn			r-rd			ext-r-w	ext-j-s				metl	Hart	Old Reliable
		Stmbg	grav	d-d		selec		jst	4	chn			r-rd			int-r-w	ext-j-s				metl	Hart	Old Reliable
980	16	Stmbg	grav	w-d	M-Evn	id-c	Cotta	amid	3	worm	Timkn	8.7	r-rd	spgs	Mthr	int-r-w	int-r-w	l	Ross	c	metl	Spicer	Oneida A
1,040	15	Stmbg	grav	w-d	M-Evn	id-c	Cotta	amid	3	worm	Timkn	9.2	r-rd	spgs	Mthr	int-r-w	int-r-w	l	Ross	c	metl	Spicer	Oneida B
970	14	Stmbg	grav	w-d	M-Evn	id-c	Cotta	amid	3	worm	Timkn	9.2	r-rd	spgs	Mthr	int-r-w	int-r-w	l	Ross	c	metl	Spicer	Oneida C
1,150	12	Stmbg	grav	w-d	M-Evn	id-c	Cotta	amid	3	worm	Timkn	10.3	r-rd	spgs	Mthr	int-r-w	int-r-w	l	Ross	c	metl	Spicer	Oneida D
		Tiltsn	vacm	cone	own	selec	own	r-ax	3	bevel	own	4.3	t-tb	t-tb	Perf	int-r-w	ext-r-w	l	own	c			Overland
		Tiltsn	grav	cone	own	selec	own	r-ax	3	bevel	own	4.4	t-tb	t-tb	Perf	int-r-w	ext-r-w	l	own	c			Overland
1,000	16	own	pres	d-d	own	selec	own	amid	4	worm	own	6.2	r-rd	tor-a		int-r-w	ext-sht		own				Packard D
1,000	16	own	pres	d-d	own	selec	own	amid	4	worm	own	6.2	r-rd	tor-a		int-r-w	ext-sht		own				Packard D
1,000	14	own	pres	d-d	own	selec	own	amid	4	worm	own	7.2	r-rd	tor-a		int-r-w	ext-sht		own				Packard D
1,000	12	own	pres	d-d	own	selec	own	amid	4	worm	own	9.0	r-rd	tor-a		int-r-w	ext-sht		own				Packard D
1,000	12	own	pres	d-d	own	selec	own	amid	4	worm	own	10.0	r-rd	tor-a		int-r-w	ext-sht		own				Packard D
1,000	11	own	pres	d-d	own	selec	own	amid	4	worm	own	10.7	r-rd	tor-a		int-r-w	ext-sht		own				Packard
1,000	11	own	pres	d-d	own	selec	own	amid	4	worm	own	10.7	r-rd	tor-a		int-r-w	ext-sht		own				Packard
1,500	25	Carter	grav		own	fric	own	jst	3	chn	own	4.0	r-rd		Tut	r-w	int-	l	own	l			Packet
		Stmbg	grav	w-d	Fuller	prog	Fuller			in-g	Torb		r-rd	tor-t	Chmp	int-r-w			Ross		metl	Blood	Palmer
1,000	15	Stmbg	grav	w-d	Fuller	prog	Fuller			worm	Timkn		r-rd	tor-t	Chmp	int-r-w			Ross		metl	Blood	Palmer
925	16	Stmbg	grav	cone	own	selec	B-Lipe	amid	3	worm	Timkn	6.2	spgs	spgs	Std	int-r-w	ext-r-w	r	own	r	metl	Spicer*	Peerless TC
925	15	Stmbg	grav	cone	own	selec	own	jst	4	chn	own	7.4	r-rd		Std	int-r-w	ext-j-s	r	own	r	metl	Spicer*	Peerless TC
925	13	own	grav	cone	own	selec	own	jst	4	chn	own	8.6	r-rd		own	int-r-w	ext-j-s	r	own	r	metl	Spicer*	Peerless TC
925	11	Stmbg	grav	cone	own	selec	own	jst	4	chn	own	10.4	r-rd		own	int-r-w	ext-j-s	r	own	r	metl	Spicer*	Peerless TC
925	11	Stmbg	grav	cone	own	selec	own	jst	4	chn	own	10.4	r-rd		own	int-r-w	ext-j-s	r	own	r	metl	Spicer*	Peerless TC
1,050	16	own	grav	cone	own	selec	own	amid	4	worm	own		r-rd	tor-a	own	int-r-w	ext-d-s	r	own	r		own	Pierce-Arrow
950	14	own	grav	cone	own	selec	own	amid	3	worm	own		r-rd	tor-a	own	int-r-w	ext-d-s	r	own	r		own	Pierce-Arrow
1,050	12				B-Beck		Warner					9.9											Pull-More
		Zenith	vacm	d-p	B-Beck	selec	G-Lees	mtr	3	worm	Timkn	5.8	spgs	spgs	Perf	int-r-w	int-r-w	l	Lavn	r	metl	Arvac	Rainier R
1,200	18	Stmbg	vacm	d-d	Warner	selec	Warner	amid	4	worm	Wis	8.6	spgs	spgs	Rowl	int-r-w	int-r-w	l	Lavn	c	metl	Hart	Rennoc-Leslie
1,200	18	Stmbg	vacm	d-d	Warner	selec	Warner	amid	4	worm	Wis	8 6	spgs	spgs	Rowl	int-r-w	int-r-w	l	Lavn	c	metl	Hart	Rennoc-Leslie Tractor
		Jhnson	grav	d-d	own	selec	own	amid	3	bevel	own	4.3	spgs	tor-a	Penn		dual-rw	l	own		fab*	Roid*	Reo F
1,250	14	Jhnson	grav	d-d	own	selec	own	amid	3	chn	own	8.8	r-rd		Penn	ext-r-w	ext-j-s	l	own	c	fab*	Roid*	Reo J
900	20	Marvel	grav	d-d	Covert	selec	Covert	mtr	3	in-g	Torb	5.4	spgs	spgs	Dtrt	ext-sht	ext-r-w	l	Jacx	c	metl	Univ	Republic
900	17	Marvel	grav	d-d	Covert	selec	Covert	mtr	3	in-g	Torb	6.7	spgs	spgs	Dtrt	ext-sht	ext-r-w	l	Jacx	c	metl	Univ	Republic
950	17	Stmbg	grav	d-d	Fuller	selec	Fuller	mtr	3	in-g	Torb	7.2	spgs	spgs	Dtrt	int-r-w	ext-r-w	l	Jacx	c	metl	Arvac	Republic 10
980	15	Stmbg	grav	d-d	Fuller	selec	Fuller	mtr	3	in-g	Torb	8.0	spgs	spgs	Dtrt	int-r-w	ext-r-w	l	Jacx	c	metl	Arvac	Republic 11
980	12	Stmbg	grav	d-d	Fuller	selec	Fuller	mtr	3	in-g	Torb	8.0	spgs	spgs	Dtrt	int-r-w	ext-r-w	l	Jacx	c	metl	Arvac	Republic A
1,050	11	Stmbg	grav	d-d	Muncie	selec	Muncie	mtr	4	in-g	Clfr	10.0	spgs	spgs	Shel	int-r-w	ext-r-w	l	Ross	c	metl	K-B	Republic T
1,021	10	Zenith	grav	d-d	B-Beck	selec	B-Beck	amid	4	in-g	Clfr	12.5	spgs	spgs	Shel	int-r-w	int-r-w	l	Ross	c			Republic V
		Schblr	grav	w-d		selec		mtr	3	bevel	Peru	4.7	spgs	spgs	Kal	int-r-w	ext-r-w	l	Gem	c			Reya 18
1,350	14	Ball	grav	cone	own	selec	own	amid	4	worm	own	10.0	r-rd	tor-a	S-P	int-r-w	ext-d-s	r	Ross	r		own	Riker B
1,350	14	Ball	grav	cone	own	selec	own	amid	4	worm	own	10.0	r-rd	tor-a	S-P	int-r-w	int-d-s	r	Ross	r		own	Riker BB
	15	Rayfld*	grav	d-d		selec		mtr	4	worm								l		c	metl	M-E	Rowe CDW
	15	Rayfld*	grav	d-d		selec		rtr	4	worm								l		c	metl	M-E	Rowe CDW
	12	Rayfld*	grav	d-d		selec		mtr	4	worm								l		c	metl	M-E	Rowe DEW
	10	Rayfld*	grav	d-d		selec		mtr	4	worm								l		c	metl	M-E	Rowe GW
*1,600	25*	Master	grav	d-p		id-c		amid	3	worm	Shel*		spgs	spgs		int-r-w	int-r-w		Ross				Royal
1,600	18	Master	grav	d-p	*	id-c		amid	3	worm	Shel*		spgs	spgs		int-r-w	int-r-w		Ross				Royal
1,600	15	Master	grav	d-p		id-c		amid	3	worm	Timkn*		spgs	spgs		int-r-w	int-r-w		Ross				Royal

ABBREVIATIONS—Makers of Parts

*Other Options
A-K—Atwater-Kent
Aut-L—Auto-Lite
B-Beck—Borg & Beck
B-Lipe—Brown-Lipe
Brm—Bremer
Bud—Buda
Brem—Bremer
Can—Candler
Celfr—Celfor
Chgo—Chicago
Con—Continental
Conn—Connecticut
Dtrt—Detroit
Dynt—Dyneto
Eismn—Eisemann
E-M—English & Mersick
Eur—Eureka
Fed—Fedders
Franck—Francke
G&O—G & O Mfg. Co.
GBS—Golden, Belknap & Swartz
G-C—Garden City
Gem—Gemmer
Har—Harrison
Hart—Hartford
Hays—Hayes
Hig—Higgins
H-Shaw—Hele-Shaw
H-S—Herschell-Spillman
Idl—Ideal
Iron—Iron City
Jacx—Jackson-Church-Wilcox
Jhnson—Johnson
Kal—Kalamazoo
K-B—Kinsler-Bennett
Key-H—Keystone-Hindley
Lavn—Lavigne
LeR—LeRoi
Lgt—Light
Ligt—Liggett
Lyc—Lycoming
M'C—McCord
Merl—Merrill
Mil—Milwaukee
Mnrch—Monarch
Mthr—Mather
Natl—National
N. A.—North American
P & B—Parish & Bingham
Perf—Perfection
Prsh—Parish
R-T—Rome-Turney
Rayfld—Rayfield
Rowl—Wm. Harvey Rowland
Russl—Russel
Rut—Rutenber
Salsby—Salisbury
Savg—Savage Arms
Schblr—Schebler
Shel—Sheldon
Shkspr—Shakespeare
Smth—A. O. Smith
S-P—Spring-Perch
Spltf—Splitdorf
Stewrt—Stewart
Stmbg—Stromberg
Sundmn—Sunderman
S_W—Sparks-Withington
Ther—Thermoid
Timkn—Timken
Torb—Torbenson
Tut—Tuthill
Univ—Universal Machine Co.
Wau—Waukesha
Wilcx—Wilcox
Wis—Wisconsin

Prices are exclusive of the 3 per cent Government war tax

Technical Specifications of Gasoline

Name and Model	Tons Capacity	Chassis Price	Wheelbase, Inches	FRAME			TIRES			Wheels	ENGINE														
								Sizes in Ins.						COOLING			IGNITION			ELEC. SYSTEM			GOVERNOR		
				Make	Material	Type	Kind	Front	Rear		Make	No. Cyl. Bore and Stroke—R.A.C.C., Hp.	Cylinders Cast	Water Circ.	Radiator Make	Radiator Core and Case	Type	Make	Spark Advance	Type	Make	Extra Cost	Type	Make	Drive
Royal	5	.....	168*	.....	.....	.....	s....	36x6	40x6d	....	Wis..	4-4½x5½-36.2	2	.....	.....	.....	sing..	Bosch.	fix...	.....	.....	.....	suct..	Mnrch..	motor.
Royal	6	.....	158*	.....	.....	.....	s....	36x6	40x6d	....	Wis..	4-5½x6*-42.2*	2	.....	.....	.....	sing..	Bosch.	fix...	.....	.....	.....	suct..	Mnrch..	motor.
Royal	7	.....	158*	.....	.....	.....	s....	36x7	40x7d	....	Wis.	4-5½x7 -44.2	2	.....	.....	.....	sing..	Bosch.	fix...	.....	.....	.....	suct..	Mnrch..	motor.
Rush.....D	½	895	105	.....	.....	.....	pnu..	31x4	31x4	....	Lyc..	4-3½x5 -16.9	4	.....	.....	.....	sing..	Conn..	hand.	s&l...	Spltf..	.....	.....	.....	.....
Sandow.....A	1	1,485	120	.....	p-stl.	flex..	opt..	31x4	34x4	wd..	Con..	4-3½x5 -19.6	4	ther....	Brem	cel-cst..	sing..	Eismn	auto	.....	.....	.....	.....	.....	.....
Sandow.....B	2	2,450	165	.....	p-stl.	s-flx..	s....	36x5	36x5d	wd..	Con..	4-4½x5½-27.2	4	ther....	Brem	fin-sht..	sing..	Bosch.	auto	.....	.....	.....	suct..	Mnrch..	motor.
Sandow.....B	1½	1,875	138	.....	p-stl.	.....	s....	34x4	34x5	....	Con..	4-3½x5 -19.6	4	ther....	.....	.....	.....	.....	auto	.....	.....	.....	.....	.....	.....
Sandow.....E	3½	3,450	175*	.....	rol-c	.....	s....	36x5	36x5d	wd..	Con..	4-4½x5½-32.4	....	cent....	.....	.....	sing..	Bosch.	.....	.....	.....	.....	suct..	.....	motor.
Sanford.....W15	1½	2,200	140	Prsh..	p-stl.	s-flx..	s....	36x3½	36x5	wd..	Con..	4-3½x5½-22.5	4	cent....	M'C.	fin-cst..	sing..	Bosch.	fix...	sl&i 2.	Remy.	stk..	cent..	Pierce...	motor.
Sanford.....W25	2½	2,800	156	Prsh..	p-stl.	s-flx..	s....	36x4	36x4d	wd..	Con..	4-4½x5½-27.2	4	cent....	M'C.	fin-cst..	sing..	Bosch.	fix...	none..	none..	.....	cent..	Pierce...	motor.
Sanford.....W35	3½	3,600	174	Prsh..	p-stl.	s-flx..	s....	36x5	36x5d	wd..	Bud..	4-4½x6 -32.4	4	cent....	M'C.	fin-cst..	sing..	Bosch.	fix...	none..	none..	.....	cent..	Pierce...	motor.
Schleicher	3	3,500	150*	.....	.....	.....	s....	34x4½	34x3½d	....	Con..	4-4½x5½-29.0	2	.....	.....	.....	.....	Bosch.	hand.	.....	.....	.....	.....	opt....	.....
Schleicher	5	4,500	150*	.....	.....	.....	s....	34x5	34x4d	....	Con..	4-5 x6 -40.0	2	.....	.....	.....	.....	Bosch.	hand.	.....	.....	.....	.....	.....	.....
Selden.....G	4½	.....	130	P&B..	p-stl.	s-flx..	pnu..	32x3½	33x4	wd..	LeR..	4-3½x4½-15.6	4	ther....	Bush.	fin-sht..	sing..	Eismn	fix...	s&l 2..	A-C...	opt..	cent..	LeR....	motor.
Selden.....TXL	1	.....	140	P&B..	p-stl.	s-flx..	s....	34x3	34x4	wd..	Con..	4-3½x5 -19.6	4	ther....	Bush.	fin-sht..	sing..	Bosch.	fix...	s&l 2..	N-E..	opt.	cent..	Pierce...	motor.
Selden.....B	2	.....	162	P&B..	p-stl.	s-flx..	s....	36x4	36x6	wd..	Con..	4-4½x5½-27.2	4	cent....	Bush.	fin-sht..	sing..	Bosch.	fix...	s&l 2..	N-E..	opt	cent..	Pierce...	motor.
Selden.....BR	2½	.....	162	P&B..	p-stl.	s-flx..	s....	36x4	36x6	wd..	Con..	4-4½x5½-27.2	4	cent....	Bush.	fin-sht..	sing..	Bosch.	fix...	s&l 2..	N-E..	opt	cent..	Pierce...	motor.
Selden.....C	3½	.....	180	P&B..	p-stl.	s-flx..	s....	36x5	36x5d	wd..	Con..	4-4½x5½-32.4	2	cent....	Bush.	fin-cst..	sing..	Eismn	hand.	s&l 2..	N-E..	opt.	cent..	Pierce...	motor.
Selden.....D	5	.....	169	P&B..	p-stl.	s-flx..	s....	36x6	40x6d	met.	Con..	4-4½x5½-36.1	2	cent....	Bush.	fin-cst..	sing..	Eismn	hand.	s&l 2..	N-E..	opt	cent..	Pierce...	motor.
Service.....220	1	1,500	137	.....	p-stl.	s-flx..	opt..	34x3	34x4	wd..	Bud..	4-3½x5½-19.6	4	ther....	Long.	fin-cst..	sing..	Eismn	hand.	s&l 2*.	West*.	120*	none	none....	none..
Service.....230	1½	2,200	150	.....	p-stl.	s-flx..	s....	36x3½	36x5	wd..	Bud..	4-4 x5½-25.6	4	cent....	Long.	fin-cst..	sing..	Eismn	hand.	s&l 2*.	West*.	140*	cent..	Duplex..	motor.
Service.....240	2	2,500	160	.....	p-stl.	s-flx..	s....	36x4	36x7	wd..	Bud..	4-4½x5½-28.9	4	cent....	Long.	fin-cst..	sing..	Eismn	hand.	s&l2*..	West*.	140*	cent..	Duplex..	motor.
Service.....270	3½	3,300	171	.....	p-stl.	s-flx..	s....	36x5	36x5d	wd..	Bud..	4-4½x5½-28.9	4	cent....	Long.	fin-cst..	sing..	Eismn	hand.	s&l 2*.	West*.	140*	cent..	Duplex..	motor.
Service.....275	3½	3,600	171	.....	p-stl.	s-flx..	s....	36x6	36x6d	wd..	Bud..	4-4½x6 -32.4	4	cent....	Long.	fin-cst..	sing..	Eismn	auto	s&l 2*.	West*.	140*	cent..	Duplex..	motor.
Service.....300	5	4,300	171½	.....	p-stl.	s-flx..	s....	36x6	40x6d	wd..	Bud..	4-4½x6 -32.4	4	cent....	Long.	fin-cst..	sing..	Eismn	auto.	s&l 2*.	West*.	140*	cent..	Duplex..	motor.
Signal.....F	1½	1,875	144	Prsh..	p-stl.	s-flx..	s....	34x3½	36x5	wd..	Con..	4-3½x5½-22.5	4	cent....	M'C.	fin-cst..	sing..	Eismn	fix...	none..	none..	.....	suct.	Mnrch..	motor.
Signal.....H	2	2,375	144	Prsh..	p-stl.	s-flx..	s....	34x4	36x6	wd..	Con..	4-4½x5½-27.2	4	cent....	M'C.	fin-cst..	sing..	Eismn	fix...	none..	none..	.....	suct.	Mnrch..	motor.
Signal.....J	2½	2,835	150	Prsh..	p-stl.	s-flx..	s....	34x4	36x8	wd..	Con..	4-4½x5½-27.2	4	cent....	M'C.	fin-cst..	sing..	Eismn	fix...	none..	none..	.....	suct.	Mnrch..	motor.
Signal.....M	4	3,825	168	Prsh..	p-stl.	s-flx..	s....	36x5	40x5d	wd..	Con..	4-4½x5½-32.4	2	cent....	M'C.	fin-cst..	sing..	Eismn	fix...	none..	none..	.....	suct.	Mnrch..	motor.
Signal.....R	5	4,475	180	Prsh..	p-stl.	s-flx..	s....	36x6	40x6d	wd..	Con..	4-4½x5½-32.4	2	cent....	M'C.	fin-cst..	sing..	Eismn	fix...	none..	none..	.....	suct.	Mnrch..	motor.
Standard.....70	2	2,500	140	.....	rol-c	s-flx..	s....	36x4	36x5	wd..	Con..	4-4½x5½-27.2	4	cent....	Long.	fin-cst..	sing..	Eismn	fix...	.....	.....	.....	cent..	Pierce...	motor.
Standard.....65	3½	3,200	156	.....	rol-c	s-flx..	s....	36x5	36x5d	wd..	Con..	4-4½x5½-32.4	2	cent....	Long.	fin-cst..	sing..	Eismn	auto	.....	.....	.....	cent..	Pierce...	motor.
Standard.....85	5	4,000	156	.....	rol-c	s-flx..	s....	36x6	40x6d	wd..	Con..	4-4½x5½-32.4	2	cent....	Long.	fin-cst..	sing..	Eismn	auto	.....	.....	.....	cent..	Pierce...	motor.
Steele.....C	2	2,250	115*	.....	.....	.....	s....	38x4	40x4d	....	Con..	4-4½x5½-27.2	4	.....	.....	.....	sing..	A-Kt..	auto.	ltg....	Carl....	.....	cent..	own....	motor.
Steele.....B	3	3,000	127*	.....	.....	.....	s....	38x6	40x5d	....	own..	4-5 x5 -40.0	2	.....	.....	.....	sing..	A-Kt..	auto.	ltg....	Carl....	.....	cent..	own....	motor.
Steele.....BA	4	3,500	127*	.....	.....	.....	s....	38x6	40x5d	....	own..	4-5 x5 -40.0	2	.....	.....	.....	sing..	A-Kt..	auto.	ltg....	Carl....	.....	cent..	own....	motor.
Steele.....A	5	4,000	127*	.....	.....	.....	s....	38x7	40x6d	....	own..	4-5 x5 -40.0	2	.....	.....	.....	sing..	A-Kt..	auto.	ltg....	Carl....	.....	cent..	own....	motor.
Stegeman	2	2,600	150	own..	p-stl.	flex..	s....	34x4	36x4d	wd..	Con..	6-3½x5½-29.4	4	cent....	Bush.	s-t-cst..	sing.	Dixie..	fix...	s&l 2..	West..	stk..	suct..	Mnrch..	motor.
Stegeman	3	3,000	160	own..	p-stl.	flex..	s....	34x4	36x5d	wd..	Con..	6-3½x5½-29.4	4	cent....	Bush	s-t-cst..	sing.	Dixie..	fix...	s&l 2..	West..	stk..	suct..	Mnrch..	motor.
Stegeman	4	3,800	160	own..	p-stl.	flex..	s....	36x5	40x5d	wd..	Con..	6-3½x5½-33.8	3	cent....	Bush.	s-t-cst..	sing.	Dixie..	fix...	s&l 2..	West..	stk..	suct..	Mnrch..	motor.
Stegeman	5	4,500	168	own..	p-stl.	flex..	s....	36x5	40x6d	wd..	H-S..	6-4 x5½-38.4	4	cent....	Bush.	s-t-cst..	sing.	Dixie..	fix...	s&l 2..	West..	stk..	suct.	Mnrch..	motor.
Stegeman	7	5,000	168	own..	rol-c	flex.	s....	36x6	40x7d	c-s..	H-S..	6-4 x5½-38.4	4	cent....	Bush.	s-t-cst..	sing.	Dixie..	fix...	s&l 2..	West..	stk..	suct.	Mnrch..	motor.
Sterling	2½	2,950	156	Smth..	p-stl.	s-flx..	s....	36x4	36x4d	wd..	Wau.	4-4½x5½-28.9	2	cent....	Long.	fin-cst..	sing.	Eismn	auto.	none..	none..	none	cent..	Wau....	motor.
Sterling	3½	3,900	162	Smth..	p-stl.	s-flx..	s....	36x5	40x5d	wd..	Wau.	4-4½x6½-28.9	2	cent....	Long.	fin-cst..	dual.	Eismn	auto	ltg....	Vesta	stk..	cent..	Wau....	motor.
Sterling	5	4,750	168	Smth..	p-stl.	s-flx..	s....	36x6	40x6d	wd..	Wau.	4-4½x6½-36.1	2	cent....	Long.	fin-cst..	sing.	Eismn	auto	ltg....	Vesta	stk..	cent..	Wau....	motor.
Sterling	7	5,250	168	Smth..	p-stl.	s-flx..	s....	36x6	40x7d	wd..	Wau	4-4½x6½-36.1	2	cent....	Long.	fin-cst..	dual	Eismn	hand.	ltg....	Vesta	stk..	cent..	Wau....	motor.
Stewart.....6	⅔	845	110	.....	p-stl.	s-flx..	pnu..	32x4	32x4	wd..	Mil..	4-3½x4½-14.4	4	ther....	Bush.	fin-ps..	sing..	Brlng.	fix...	.....	.....	.....	.....	.....	.....
Stewart.....9	1½	1,750	140	.....	p-stl.	.....	s....	34x3½	34x4	....	Con..	4-3½x5 -22.5	4	ther....	Bush.	fin-cst..	sing..	Brlng.	fix...	.....	.....	.....	.....	.....	.....
Stewart.....7	2	2,195	156	.....	p-stl.	.....	s....	34x4	34x4d	wd..	Bud.	4-4½x5½-27.2	4	cent....	Bush.	fin-cst..	sing..	Brlng.	fix...	.....	.....	.....	.....	Pierce...	.....
Studebaker.....SF	½	945	112	own..	p-stl.	s-flx..	pnu..	35x4½	35x4½	wd..	own..	4-3½x5 -24.2	4	cent....	M'C.	cel-ps..	sing..	Remy.	hand.	sl&i 2	Wag..	stk..	.....	.....	.....
Studebaker.....7	1	1,350	125	own..	p-stl.	s-flx..	pnu..	35x5	35x5	wd..	own..	4-3½x5 -24.2	4	cent....	M'C.	cel-ps..	sing..	Remy.	hand.	sl&i 2	Wag..	stk..	cent..	Pierce...	motor.
Sullivan.....F	1½	2,150	129	.....	rol-c	s-flx..	s....	36x3	36x5	wd..	Bud..	4-3½x4½-22.5	4	ther....	Bush.	fin-sht..	sing..	Bosch.	fix...	none..	none..	.....	none	none...	.....
Sullivan.....E	2	2,600	150	.....	p-stl.	s-flx..	s....	36x4	36x6	wd..	Bud..	4-4½x5½-27.2	4	cent....	Bush.	fin-cst..	sing..	Bosch.	fix...	none..	none..	.....	none	none....	.....
Superior.....A	1	1,500	124*	.....	.....	.....	s....	34x3½	34x4	....	Beav.	4-3½x5 -19.6	4	.....	.....	.....	sing..	Eismn	fix...	.....	.....	.....	suct.	Mnrch..	motor.
Superior.....C	2	2,000	144	.....	.....	.....	s....	36x4	36x6	....	Beav.	4-3½x5 -22.5	4	.....	.....	.....	sing..	Eismn	fix...	.....	.....	.....	suct.	Mnrch..	motor.
Taylor	1	1,750	134	.....	p-stl.	s-flx..	s....	34x4	34x5	wd..	Con..	4-3½x5 -19.6	4	cent....	Long.	fin-cst..	sing..	Eismn	hand.	.....	.....	.....	cent..	Pierce...	gset..
Taylor	1½	2,200	142	.....	p-stl.	s-flx..	s....	34x4	34x6	wd..	Con..	4-3½x5 -22.5	4	cent....	Long.	fin-cst..	sing..	Eismn	hand.	.....	.....	.....	cent..	Pierce...	gset..
Taylor	2½	2,900	145	.....	p-stl.	s-flx..	s....	36x4	36x7	c-s..	Con..	4-4½x5½-27.2	4	cent....	Long.	fin-cst..	dual..	Eismn	hand.	.....	.....	.....	cent..	Pierce...	gset..
Taylor	3½	3,650	156	.....	p-stl.	s-flx..	s....	36x5	40x10	c-s..	Con..	4-4½x5½-32.4	4	cent....	Long.	fin-cst..	dual..	Eismn	hand.	.....	.....	.....	cent..	Pierce...	gset..
Taylor	5	4,600	160	.....	p-stl.	.....	s....	36x6	40x14	c-s..	Con..	4-5½x5½-44.2	2	cent....	Long.	fin-cst..	dual..	Eismn	hand.	.....	.....	.....	cent..	Pierce...	gset..
Thomas.....40	2	3,000	150	.....	p-stl.	rigid.	s....	34x5	34x4d	wd..	Bud..	4-4½x5½-28.9	4	cent....	.....	fin*-sht..	sing..	Sims..	fix...	ltg....	Bijur..	stk..	cent..	Pierce...	gset..
Thomas.....70	3½	3,500	150	.....	p-stl.	rigid.	s....	34x5	34x5d	wd..	Bud..	4-4½x6 -28.9	4	cent....	.....	fin*-sht..	sing..	Sims..	fix...	ltg....	Bijur..	stk..	cent..	Pierce...	gset..
Tiffin.....A	¾	1,190	110	.....	p-stl.	flex..	pnu..	35x4½	35x4½	wd..	Con..	4-3½x5 -19.6	4	ther....	Bush.	fin-sht..	sing..	Bosch.	hand.	none..	none..	.....	none	none....	none..
Tiffin.....AW	1	1,550	112	.....	p-stl.	flex..	s....	34x3	34x4	wd..	Con..	4-3½x5 -19.6	4	ther....	Bush.	fin-sht..	sing..	Bosch.	hand.	none..	none..	.....	cent..	Pierce...	motor.
Tiffin.....GW	1½	1,970	135	.....	p-stl.	flex..	s....	36x3½	36x5	wd..	Con..	4-3½x5½-22.5	4	cent....	Bush.	fin-sht..	sing..	Bosch.	hand.	none..	none..	.....	cent..	Pierce...	motor.
Tiffin.....MC	2½	2,500	140	.....	p-stl.	s-flx..	s....	36x4	36x3½d	wd..	Con..	4-4½x5½-27.2	4	cent....	Bush.	fin-sht..	sing..	Bosch.	hand.	none..	none..	.....	cent..	Pierce...	motor.
Tiffin.....MW	2½	2,700	140	.....	p-stl.	s-flx..	s....	36x4	36x3½d	wd..	Con..	4-4½x5½-27.2	4	cent....	Bush.	fin-sht..	sing..	Bosch.	hand.	none	none..	.....	cent..	Pierce...	motor.
Tiffin.....PW	3½	3,400	156	.....	rol-c	s-flx..	s....	36x5	36x5d	wd..	Con..	4-4½x5½-32.4	2	cent....	Bush.	fin-sht..	sing..	Bosch.	hand.	none..	none..	.....	cent..	Pierce...	motor.
Tiffin.....RW	5	4,550	168	.....	rol-I.	rigid.	s....	36x5	40x5d	wd..	Con..	6-3½x5½-33.8	3	cent....	Bush.	fin-sht..	sing..	Bosch.	hand.	s&i 2.	Spltf..	stk..	cent..	Pierce...	.....
Tiffin.....SW	6	4,650	168	.....	rol I.	rigid.	s....	36x6	36x6d	c-s..	Con..	6-3½x5½-33.8	3	cent....	Bush.	fin-sht..	sing..	Bosch.	hand.	sl&i2..	Spltf..	stk..	cent..	Pierce...	.....
Titan	5	5,000	156	.....	p-stl.	s-flx..	s....	36x6	40x6d	c-s..	Bud..	4-4½x6 -32.4	4	cent....	Perf..	cel-cst..	sing..	Bosch.	hand.	ltg....	Bosch.	stk..	cent..	Simplex.	motor.
Transport Tractor.....T	5	2,750	80	.....	rol-c.	rigid.	s....	34x3½	34x4d	wd..	.....	4-3½x5 -22.5	4	ther....	.....	cel-sht..	sing..	Bosch.	fix...	none..	none..	.....	suct..	Mnrch..	motor.
Triangle.....A	1½	.....	144	.....	rol-c.	s-flx..	s....	34x3½	34x5	wd..	Wau.	4-3½x5½-22.5	4	cent....	.....	zz-t-...	sing..	Eismn	fix...	.....	.....	.....	cent..	Wau....	motor.

ABBREVIATIONS—Types of Construction

*Other Options
amid—amidships
auto—automatic
c—center
c&l—center and left
c-s—cast steel
cent—centrifugal
cel-cst—cellular core cast case
cel-sht—cellular core sheet case
cylinders cast, 2 in pair
cylinders cast, 4 in block
cylinders cast, 3 in threes
cylinders cast, 1 singly
d-d—dry disk
d-p—dry plate
d-rd—double reduction
elec—electric
ext-dst—external drive-shaft
ext-f-s—external front wheels.
ext-jst—external jack-shaft
ext-r-w—external rear wheel
fab—fabric
fin-sht—finned tube core sheet case
flx—fixed
d—dual
flex—flexible
fric—friction
gset—gearset
grav—gravity
hyd—hydraulic
ind-c—individual clutch
int-dst—internal drive-shaft
int-f-w—internal front wheels
in-g—internal gear
in-g-4—internal gear drive on 4 wheels
int-r-w—internal rear wheel
jst—unit with jackshaft
l—left
ltg—lighting
metl—metal
mtr—unit with motor
opt—optional
pist—piston pump
plan—planetary
pnu—pneumatic
pres—pressure
prog—progressive sliding gear
p-stl—pressed steel
r—right
r-a—unit with rear axle
ring-cst—ring core cast case
rol-c—rolled channel
rol-i—rolled I-beam
r-rd—radius rods
selec—selective sliding gear
s-flx—semi-flexible
s & l—starting and lighting
s, 1 & l—starting, lighting and ignition
s, 1 & l 2—starting, lighting and ignition two-unit
sing—single
s—solid
spgs—springs
sq-t-sht—square tube core sheet case
stk—stock
sub-f—sub-frame
ther—thermo-syphon
tor-a—torque arm
tor-t—torsion tube
vacm—vacuum
wd—wood
w-d—multiple disk in oil
worm—top worm
w-p—wet plate
zz-t-sht—zig-zag tube core sheet case

Prices are exclusive of the 3 per cent. Government war tax

Commercial Vehicles for 1918—Continued

ENGINE				TRANSMISSION											BRAKES		CONTROL			UNIVERSALS		
SPEED		FUEL SYS.		CLUTCH		GEARSET				FINAL DRIVE							STEERING GEAR					
Motor in R.p.m.	Truck in M.p.h.	Carbureter Make	Fuel Feed	Type	Make	Type	Make	Placed	Speeds	Type	Axle Make	Total Gear Reduction	Propulsion Taken By	Torque Taken By	Make Springs	Foot	Hand	Placed	Make	Levers	Type	Make	Name and Model
*900	10*	Master	grav	w-d		id-c		amid	3	worm	Timkn		spgs	spgs		int-r-w	int-r-w		Ross				Royal
*900	10*	Master	grav	w-d		id-c		amid	3	worm*	Shel*		spgs*	spgs*		int-r-w	int-r-w		Ross				Royal
*900	10*	Master	grav	w-d		id-c		amid	3	chn	Shel*		r-rd			int-r-w	int-r-w		Ross				Royal
1,600	29	Carter	grav	w-d	B-Beck	selec		mtr	3	bevl	own		spgs	tor-t		int-r-w	ext-r-w		Lavn				Rush D
		Stmbg	vacm	d-d	Fuller	selec	Fuller	mtr	3	worm	Timkn	6.5	spgs	spgs	Dtrt	int-r-w	int-	l	Ross	c			Sandow A
1,100	15	Stmbg	vacm	d-d	B-Lipe	selec	B-Lipe	mtr	3	worm	Timkn		spgs	spgs	Dtrt	int-r-w	int-r-w	r	Ross	r			Sandow B
		Stmbg		d-d		selec			3	worm	Timkn	8.7				int-r-w	int-r-w	l		c			Sandow B
	12	Stmbg		d-d		selec		mtr	3	worm	Timkn	8.8				int-r-w	int-r-w			c			Sandow E
1,200	16½	Stmbg	grav	d-d	B-Lipe	selec	B-Lipe	mtr	3	worm	Shel	7.8	spgs	spgs	Perf	int-r-w	int-r-w	l	Ross	c	metl	Spicer*	Sanford W15
1,100	15	Stmbg	grav	d-p	B-Beck	selec	Dtrt	amid	4	worm	Shel	8.7	spgs	spgs	Perf	int-r-w	int-r-w	l	Ross	c	metl	Spicer*	Sanford W25
1,100	13	Stmbg	grav	d-p	B-Beck	selec	Warner	amid	4	worm	Shel	8.8	spgs	spgs	Perf	int-r-w	int-r-w	l	Ross	c	metl	Spicer*	Sanford W35
1,200	25	Stmbg	grav				own			chn	own		r-rd			ext-r-w	ext-sht						Schleicher
1,200	20	Stmbg	grav	cone		selec	own	amid	4	chn	own		r-rd			ext-r-w	ext-sht						Schleicher
1,260	20	Schblr	grav	d-d	Dtrt	selec	Dtrt	mtr	3	worm	Shel	6.2	spgs	spgs	Perf	int-r-w	int-r-w	r	Lavn	c	metl	Arvac	Selden G
1,250	15	Stmbg	grav	d-d	Covt	selec	Covt	mtr	3	in-g	Russl	8.2	spgs	spgs	Perf	int-r-w	ext-r-w	r	Lavn	c	metl	Spicer	Selden TXL
1,295	15	Stmbg	grav	d-d	B-Lipe	selec	B-Lipe	mtr	3	worm	Timkn	9.3	spgs	spgs	Perf	int-r-w	int-r-w	r	Jacx	c	metl	Spicer	Selden B
1,295	15	Stmbg	grav	d-d	B-Lipe	selec	B-Lipe	mtr	3	in-g	Russl	9.3	spgs	spgs	Perf	int-r-w	ext-r-w	r	Jacx	c	metl	Spicer	Selden BR
1,250	13	Stmbg	grav	d-d	B-Lipe	selec	B-Lipe	amid	4	worm	Timkn	10.3	r-rd	spgs	Perf	int-r-w	int-r-w	r	Ross	c	metl	Spicer	Selden C
1,250	13	Stmbg	grav	d-d	B-Lipe	selec	B-Lipe	amid	4	worm	Timkn	13.7	r-rd	spgs	Perf	int-r-w	int-r-w	r	Ross	c	metl	Spicer	Selden D
1,100	16	Stmbg	vacm	d-d	Fuller	selec	Fuller	mtr	3	worm	Timkn	7.8	spgs	spgs	Shel	int-r-w	int-r-w	l	Ross	c	metl	Arvac	Service 220
1,200	15	Master	grav	d-p	B-Beck	selec	B-Lipe	amid	3	worm	Timkn	7.8	spgs	spgs	Kal	int-r-w	int-r-w	l	Ross	c	metl	Spicer	Service 230
1,200	15	Master	grav	d-p	B-Beck	selec	B-Lipe	amid	3	worm	Timkn	7.8	spgs	spgs	Kal	int-r-w	int-r-w	l	Ross	c	metl	Spicer	Service 240
1,100	13	Master	grav	d-p	B-Beck	selec	B-Lipe	amid	4	worm	Timkn	8.8	r-rd	tor-a	Shel	int-r-w	int-r-w	l	Ross	c	metl	Spicer	Service 270
1,000	13	Master	grav	d-p	B-Beck	selec	B-Lipe	amid	4	worm	Timkn	7.8	r-rd	tor-a	Shel	int-r-w	int-r-w	l	Ross	c	metl	Spicer	Service 275
1,000	12	Master	grav	d-p	B-Beck	selec	B-Lipe	amid	4	worm	Timkn	10.3	r-rd	tor-a	Shel	int-r-w	int-r-w	l	Ross	c	metl	Spicer	Service 300
1,085	15	Stmbg	grav	d-d	B-Lipe	selec	B-Lipe	mtr	3	worm	Timkn	7.8	r-rd	spgs	Perf*	int-r-w	int-r-w	l	Ross	c	metl	Spicer	Signal F
1,300	15	Stmbg	grav	d-d	B-Lipe	selec	B-Lipe	mtr	3	worm	Timkn	9.3	r-rd	spgs	Perf*	int-r-w	int-r-w	l	Ross	c	metl	Spicer	Signal H
1,300	15	Stmbg	grav	d-d	B-Lipe	selec	B-Lipe	amid	4	worm	Timkn	9.3	r-rd	spgs	Perf*	int-r-w	int-r-w	l	Ross	c	metl	Spicer	Signal J
1,300	15	Stmbg	grav	d-d	B-Lipe	selec	B-Lipe	amid	4	worm	Timkn	10.3	r-rd	spgs	Perf*	int-r-w	int-r-w	l	Ross	c	metl	Spicer	Signal M
1,721	15	Stmbg	grav	d-d	B-Lipe	selec	B-Lipe	amid	4	worm	Timkn	13.7	r-rd	spgs	Perf*	int-r-w	int-r-w	l	Ross	c	metl	Spicer	Signal R
1,050	15	Schblr	grav	d-p	B-Beck	selec	B-Lipe	amid	4	worm	Timkn	7.8	r-rd	spgs	Tut	int-r-w	int-r-w	l	Ross	c			Standard 70
1,050	12	Schblr	vacm	d-p	B-Beck	selec	B-Lipe	amid	4	worm	Timkn	10.3	r-rd	spgs	Tut	int-r-w	int-r-w	l	Ross	c			Standard 65
1,050	10	Schblr	vacm	d-p	B-Beck	selec	B-Lipe	amid	4	worm	Timkn	13.2	r-rd	spgs	Tut	int-r-w	int-r-w	l	Ross	c			Standard 85
1,150	14½	Stmbg		w-d	H-Shaw	id-c	Cotta	jst	3	chn	own	9.5	r-rd			int-	ext-		Ross				Steele C
950	11	Stmbg	grav	w-d	H-Shaw	id-c	Cotta	jst	3	chn	own	9.2	r-rd			int-	ext-		Ross				Steele B
950	11	Stmbg	grav	w-d	H-Shaw	id-c	Cotta	jst	3	chn	own	9.2	r-rd			int-r-w	ext-jst		Ross				Steele BA
950	9	Stmbg	grav		H-Shaw	id-c	Cotta	jst	3	chn	own	9.0	r-rd			int-r-w	ext-jst		Ross				Steele A
1,100	16	Rayfld	grav	d-d	B-Lipe	selec	B-Lipe	mtr	3	worm	own	9.6	r-rd	spgs	Shel	int-r-w	int-dst	l	Ross	l	metl	M-Evn	Stegeman
1,100	14	Rayfld	grav	d-d	B-Lipe	selec	B-Lipe	mtr	3	worm	own	10.7	r-rd	spgs	Shel	int-r-w	int-dst	l	Ross	l	metl	M-Evn	Stegeman
1,100	13	Rayfld	grav	d-d	B-Lipe	selec	B-Lipe	mtr	3	worm	own	11.3	r-rd	spgs	Shel	int-r-w	int-dst	l	Ross	l	metl	M-Evn	Stegeman
1,100	12	Rayfld	grav	d-d	B-Lipe	selec	B-Lipe	mtr	3	worm	own	12.7	r-rd	spgs	Shel	int-r-w	int-dst	l	Ross	l	metl	M-Evn	Stegeman
1,100	10	Rayfld	grav	d-d	B-Lipe	selec	B-Lipe	mtr	3	worm	own	15.0	r-rd	spgs	Shel	int-r-w	int-dst	l	Ross	l	metl	M-Evn	Stegeman
1,000	16	Zenith	vacm	d-d	B-Lipe	selec	Sterlg	mtr	3	worm	Shel	7.7	r-rd	spgs	Shel	int-r-w	int-r-w	l	Ross	c	metl	Spicer	Sterling
1,000	13*	Zenith	vacm	w-d	H-Shaw	ind-c	Cotta	amid	3	worm	Timkn	8.7	r-rd	spgs	Mathr	int-r-w	int-r-w	l	Ross	c	metl	Univ	Sterling
1,000	13*	Zenith	vacm	w-d	H-Shaw	ind-c	Sterlg	amid	3	worm	Timkn	8.7	r-rd	spgs	Mathr	int-r-w	int-r-w	l	Ross	c	metl	Univ	Sterling
950	12	Zenith	vacm	w-d	H-Shaw	ind c	Sterlg	amid	3	chn	own	11.0	r-rd		Mathr	int-r-w	ext-dst	l	Ross	c	metl	Univ	Sterling
		Zenith	grav	d-d	Mech	selec	Mech	mtr	3	in-g	Clark	5.8	spgs	spgs	Dtrt		ext	l	CAS	c			Stewart 6
	15	Zenith		d-d	Fuller	selec	Fuller	mtr	3	in-g	Clark	7.0	spgs	spgs	Dtrt	ext-dst	ext-r-w	l	Ross	c			Stewart 9
1,500	15	Zenith	grav	d-d	Fuller	selec	Fuller	mtr	3	in-g	Clark	9.0	spgs	spgs	Dtrt	in-tr-w	ext-r-w	l	Ross	c			Stewart 7
		Schblr	vacm	cone	own	selec	own	r-ax	3	bevl	own	4.6	r-rd	tor-a	own	int-r-w	ext-r-w	l	Gem*	c	metl	own	Studebaker SF
960	20	Schblr	vacm	cone	own	selec	own	r-ax	3	bevl	own	5.0	r-rd	tor-a	own	int-r-w	ext-r-w	l	Gem	c	metl	own	Studebaker 7
		Holley	grav	cone	Hartfd	selec	Covert	amid	3	worm	Shel*	8.5	spgs	spgs	Merl	int-r-w	int-r-w	l	Ross	c			Sullivan F
		Holley	vacm	d-d	B-Lipe	selec	B-Lipe	mtr	3	worm	Timkn	7.8	spgs	spgs	Shel	int-r-w	int-r-w	l	Ross	c			Sullivan E
1,300	15	Stmbg	vacm	d-d	Covert	selec	Covert	mtr	3	in-g	Torb	7.0	spgs	spgs		int-r-w	ext-r-w		CAS				Superior A
1,275	15	Stmbg	vacm	d-d	Fuller	selec	Fuller	mtr	3	in-g	Torb	9.0	r-rd	spgs		int-r-w	ex-rt-w		CAS				Superior C
1,200	19	Zenith	vacm	d-p	B-Beck	selec	Covert	amid	3	worm	Timkn	7.8	r-rd	spgs	Perf	int-r-w	int-r-w	l	Ross	c	fab*	ther*	Taylor
1,100	18	Zenith	vacm	d-p	B-Beck	selec	Covert	amid	4	worm	Timkn	7.8	r-rd	spgs	Perf	int-r-w	int-r-w	l	Ross	c	fab*	ther*	Taylor
1,300	16	Zenith	vacm	d-p	B-Beck	selec	Covert	amid	4	worm	Timkn	8.8	r-rd	spgs	Perf	int-r-w	int-r-w	l	Ross	c	fab*	ther	Taylor
1,230	15	Zenith	vacm	d-p	B-Beck	selec	Covert	amid	4	worm	Timkn	8.8	r-rd	spgs	Perf	int-r-w	int-r-w	l	Ross	c	fab*	ther*	Taylor
1,166	14	Zenith	vacm	d-p	B-Beck	selec	Covert	amid	4	worm	Timkn	10.2	r-rd	spgs	Perf	int-r-w	int-r-w	l	Ross	c	fab	ther*	Taylor
	15	Stmbg	grav	d-p	Fuller	selec	Fuller	mtr	3	worm	Timkn		spgs	spgs		int-r-w	int-	l	Ross	c			Thomas 40
	12	Stmbg	grav	d-p	Fuller	selec	Fuller	mtr	3	worm	Timkn		spgs	spgs		int-r-w	ext-r-w	l	Ross	c			Thomas 70
		Schblr	grav	cone	Dtrt	selec	Dtrt	mtr	3	in-g	Russl	6.8	spgs	spgs	Kal	int-r-w	ext-r-w	l	Lavn	c			Tiffin A
1,000	15	Schblr	grav	d-d	Dtrt	selec	Dtrt	mtr	3	worm	Shel	6.5	spgs	spgs	Kal	int-r-w	int-r-w	l	Ditw	c			Tiffin AW
1,000	12	Schblr	grav	d-d	Warner	selec	Warner	mtr	3	worm	Shel	8.6	spgs	spgs	Kal	int-r-w	ext-	l	Ditw	c			Tiffin GW
1,000	11	Schblr	grav	cone	Hartfd	selec	Covert	amid	3	chn	Timkn	8.8	r-rd		Kal	int-r-w	ext-dst	l	Ditw	c			Tiffin MC
1,000	13	Schblr	grav	cone	Hartfd	selec	Covert	amid	3	worm	Timkn	7.7	spgs	spgs	Kal	int-r-w	int-r-w	l	Ditw	c			Tiffin MW
1,000	9	Schblr	grav	cone	Hartfd	selec	Covert	amid	3	worm		11.7	r-rd	spgs	Kal	int-r-w	int-r-w	l	Ross	c			Tiffin PW
1,000	10	Schblr	grav	d-p	B-Beck	selec	Covert	amid	3	worm	Shel	11.7	r-rd	spgs	Kal	int-r-w	int-r-w	l	Ross	c			Tiffin RW
1,000	9	Schblr	grav	d-p	B-Beck	selec	Covert	amid	3	worm	Shel	13.0	r-rd	Spgs	Kal	int-r-w	int-r-w	l	Ross	c			Tiffin SW
1,000	11		grav	d-p	B-Beck	ind-c	Cotta	amid	3	in-g	Celfr	11.0	r-rd	spgs	Shel	int-	int-	l	Lavn	c			Titan
		Zenith	grav	d-d		selec		mtr	4	worm			spgs	spgs		int-r-w	int-r-w	l		c			Transport Tractor T
1,200	15	Stmbg	grav	d-d	Fuller	selec	Fuller	mtr	3	in-g	Torb	8.0	spgs	spgs		ext-dst	ext-r-w	l	Gem	c			Triangle A

ABBREVIATIONS—Makers of Parts

*Other Options
A-K—Atwater-Kent
Aut-L—Auto-Lite
B-Beck—Borg & Beck
B-Lipe—Brown-Lipe
Bing—Berling
Brm—Bremer
Bud—Buda
Can—Candler
Celfr—Celfor
Chgo—Chicago
Con—Continental
Conn—Connecticut
Dtrt—Detroit
Dynt—Dyneto
Eismn—Eisemann
E-M—English & Mersick
Eur—Eureka
Fed—Fedders
Franck—Francke
G&O—G & O Mfg. Co.
GBS—Golden, Belknap & Swartz
G-C—Garden City
Gem—Gemmer
Har—Harrison
Hart—Hartford
Hays—Hayes
Hig—Higgins
H-Shaw—Hele-Shaw
H-S—Herschell-Spillman
Idl—Ideal
Iron—Iron City
Jacx—Jackson-Church-Wilcox
Jhnson—Johnson
Kal—Kalamazoo
K-B—Kinsler-Bennett
Key-H—Keystone-Hindley
Lavn—Lavigne
LeR—LeRoi
Lgt—Light
Ligt—Liggett
Lyc—Lycoming
M'C—McCord
Merl—Merrill
Mil—Milwaukee
March—Monarch
Mthr—Mather
Natl—National
N. A.—North American
P & B—Parish & Bingham
Perf—Perfection
Prsh—Parish
R-T—Rome-Turney
Rayfld—Rayfield
Rowl—Wm. Harvey Rowland
Russl—Russel
Rut—Rutenber
Savg—Savage Arms
Salsby—Salisbury
Schblr—Schebler
Shel—Sheldon
Shkspr—Shakespeare
Smth—A. O. Smith
S-P—Spring-Perch
Spltf—Splitdorf
Stewrt—Stewart
Stmbg—Stromberg
Sundmn—Sunderman
S-W—Sparks-Withington
Ther—Thermoid
Timkn—Timken
Torb—Torbenson
Tut—Tuthill
Univ—Universal Machine Co.
Wau—Waukesha
Wilcx—Wilcox
Wis—Wisconsin

Prices are exclusive of the 3 per cent Government war tax

Technical Specifications of Gasoline

Name and Model	Tons Capacity	Chassis Price	Wheelbase, Inches	FRAME			TIRES			Wheels	ENGINE															GOVERNOR		
				Make	Material	Type	Kind	Sizes in Ins. Front	Sizes in Ins. Rear		Make	No. Cyl. Bore and Stroke—N.A.C.C., Hp.	Cylinders Cast	COOLING Water Circ.	COOLING Radiator Make	COOLING Radiator Core and Case	IGNITION Type	IGNITION Make	IGNITION Spark Advance	ELEC. SYSTEM Type	ELEC. SYSTEM Make	ELEC. SYSTEM Extra Cast	GOVERNOR Type	GOVERNOR Make	GOVERNOR Drive
Union.....B	2½	1,990	152	.....	p-stl.	.....	s....	39x4	39x6	wd..	Wis..	4-4 x6 -25.6	4	ther....	R-T..	fin-cst...	sing..	Eismn	hand.	ltg....	opt...	75	cent..	Simplex..	d-sht..
U. S.....E	2	2,650	144	own...	rol-c.	flex..	s....	34x4	36x4d	wd..	Con..	4-4½x5½-27.2	4	cent...	Bush.	fin-sht...	dual..	Bosch.	hand.	ltg....	Bosch.	100	cent..	Pierce*..	motor.
U. S.....H	2	2,950	144	own...	rol-c.	flxe..	s....	34x4	36x4d	wd..	Con..	4-4½x5½-27.2	4	cent...	Bush.	fin-sht...	dual..	Bosch.	hand.	ltg....	Bosch.	100	cent..	Pierce*..	motor.
U. S.....D	3½	3,350	162	own...	rol-c.	flex..	s....	36x5	36x5d	wd..	Con..	4-4½x5½-32.4	2	cent...	Fed..	zz-t-sht..	dual..	Bosch.	hand.	ltg....	Bosch.	100	cent..	Pierce*..	motor.
U. S.....J	3½	3,650	162	own...	rol-c.	flex..	s....	36x5	40x5d	wd..	Con..	4-4½x5½-32.4	2	cent...	Fed..	zz-t-sht..	dual..	Bosch.	hand.	ltg....	Bosch.	100	cent..	Pierce*..	motor.
U. S.....K	5	4,550	168	own...	rol-c.	flex..	s....	36x5	40x6d	c-s..	Wau..	4-4½x6½-36.1	2	cent...	Bush.	fin-sht...	dual..	Bosch.	hand.	ltg....	Bosch.	100	cent..	Wau....	motor.
United F. W. D.....B	3	4,000	130	.....	rol-c.	s-flx..	s....	36x7	36x7	wd..	Bvr..	4-4½x6 -34.3	4	cent...	Chgo	fin-cst...	dual..	Eismn	hand.	ltg 2..	Bijur..	.....	cent..	Duplex..	motor.
United.....BSW	2	2,350	144*	.....	.....	.....	s....	36x4	36x4d	....	Con..	4-4½x5½-27.2	4	cent...	.....	.....	.....	Eismn	hand.	s&l...	opt.....	.....	suct..	Mnrch..	motor.
United.....CSW	3½	3,150	144*	.....	.....	.....	s....	36x5	36x5d	....	Con..	4-4½x5½-32.4	2	cent...	.....	.....	.....	Eismn	hand.	s&l...	opt.....	.....	suct..	Mnrch..	motor.
United.....DSW	4	3,450	144*	.....	.....	.....	s....	36x5	36x6d	....	Con..	4-4½x5½-32.4	2	cent...	.....	.....	.....	Eismn	hand.	s&l...	opt.....	.....	suct..	Mnrch..	motor.
United.....ESW	5	4,250	144*	.....	.....	.....	s....	36x6	40x6d	....	Wis..	4-4½x5½-41.6	2	cent...	.....	.....	.....	Eismn	hand.	s&l*..	opt.....	.....	cent..	Pierce...	dsht..
United Tractor.....	6	2,490	110	.....	.....	.....	s....	34x3½	34x7	....	Bud..	4-4½x5½-32.4	4	cent...	.....	.....	.....	Bosch.	.....	.....	.....	.....	.....	.....	.....
Universal.....G	1½	.....	133	.....	p-stl.	rigid.	.....	34x3½	34x5	wd..	Bud..	4-3½x5½-22.5	4	pist....	Long.	fin-cst...	sing..	Eismn	hand.	ltg.....	.....	.....	suct..	Mnrch..	motor.
Universal.....D	2	.....	132	.....	p-stl.	.....	s....	36x5	36x4d	wd..	own..	4-4½x5½-28.9	4	cent...	Long.	fin-cst...	sing..	Eismn	hand.	ltg.....	.....	stk..	suct*.	Mnrch*..	motor.
Universal.....L	3½	.....	156	.....	rol-c.	.....	s....	36x5	36x5d	wd..	Bud..	4-4½x5½-28.9	4	cent...	Long.	fin-cst...	sing..	Eismn	hand.	ltg.....	.....	stk..	suct*.	Mnrch*..	motor.
Velie.....25A	2	2,750	150*	Smth..	p-stl.	.....	s....	36x4	36x7	wd..	Con..	4-4½x5½-27.2	4	cent...	own..	fin-cst...	sing..	Bosch.	hand.	stg....	Remy..	.....	cent..	Pierce...	motor.
Velie.....26A	3½	3,600	172*	Smth..	p-stl.	.....	s....	36x5	40x5d	wd..	Con..	4-4½x5½-32.4	2	cent...	own..	fin-cst...	sing..	Bosch.	hand.	.....	.....	.....	cent..	Pierce...	motor.
Vim.....21	½	765	109	Prsh..	rol-c.	s-flx..	pnu..	31x4	31x4	wd..	own..	4-3 x4½-14.4	4	ther....	M'C.	fin-sht...	sing.	Dixie..	hand.	ltg.....	Spltf..	.....	none	none.....	.....
Walter.....F	5	5,000	150	.....	p-stl.	.....	s....	40x6	40x6d	c-s..	own..	4-4¾x6½-36.1	4	cent...	own..	fin-cst...	sing..	Eismn	fix..	sl&i...	West..	stk..	l-b...	own.....	motor.
Watson.....Tractor	5	4,050	80	own...	rol-c.	.....	s....	34x4s	36x5d	wd..	Con..	4-4½x5½-32.4	2	cent...	Fed..	cel-sht...	dual..	Bosch.	hand.	none..	none..	.....	cent..	Pierce...	motor.
Ware.....	3½	4,000	140	.....	p-stl.	s-flx..	s....	36x6	36x6	wd..	.....	4-5½x6 -42.2	2	cent...	.....	.....	dual..	Bosch.	hand.	ltg*...	Bosch.	.....	cent..	Pierce...	motor.
Western.....	7	4,600	146	own...	rol-c.	s-flx..	s....	36x7	40x7d	c-s..	Wis..	4-4½x5½-36.1	2	cent...	own..	s-t-cst...	sing..	Bosch.	hand.	ltg....	Vesta..	75	cent..	Simplex..	gset...
White.....GBBE	½	2,300	133	.....	p-stl.	.....	pnu..	34x4½	34x4½	wd..	own..	4-3½x5½-22.5	4	cent...	.....	cel-sht...	sing..	Eismn	hand.	s&l...	opt.....	.....	.....	none.....	.....
White.....TBC	1½	3,300	145	.....	p-stl.	.....	p&s.	36x3½	36x3½d	wd..	own..	4-3½x5½-22.5	4	cent...	.....	cel-sht...	sing..	Eismn	hand.	s&l...	opt.....	.....	.....	none.....	.....
White.....TAD	3	4,100	163	.....	rol-I.	rigid.	s....	36x5	40x5d	c-s..	own..	4-3½x5½-22.5	4	cent...	.....	cel-sht...	sing..	Eismn	hand.	.....	.....	.....	.....	none.....	.....
White.....TCD	5	5,000	169	.....	rol-I.	rigid.	s....	36x5	40x6d	c-s..	own..	4-4½x6½-29 0	4	cent...	.....	cel-sht...	sing..	Eismn	hand.	.....	.....	.....	.....	none.....	.....
White-Hickory.....H	1½	.....	144	.....	p-stl.	rigid*	s....	36x3½	36x4	wd..	Con..	4-3½x5 -22.5	4	cent...	.....	cel-ps...	sing..	Eismn	fix.....	.....	.....	.....	cent..	Pierce...	motor.
Wichita.....A	1	.....	110	.....	p-stl.	s-flx..	s....	34x3	34x4	wd..	own..	4-3½x5 -19.6	4	ther....	E-M..	sq-t-s...	sing..	Eismn	hand.	.....	.....	.....	.....	none.....	.....
Wichita.....K	1	.....	118	.....	p-stl.	s-flx..	s....	36x3	36x4	wd..	own..	4-3½x5 -19.6	4	ther....	Perf..	zz-t-c...	sing..	Eismn	hand.	.....	.....	.....	.....	none.....	.....
Wichita.....L	1½	.....	118	.....	p-stl.	s-flx..	s....	36x3	36x5	wd..	own..	4-3½x5 -19.6	4	ther....	Perf..	zz-t-c...	sing..	Eismn	hand.	.....	.....	.....	.....	none.....	.....
Wichita.....B	2	.....	118	.....	p-stl.	s-flx..	s....	34x3½	34x3d	wd..	own..	4-3½x5 -19.6	4	ther....	E-M..	sq-t-s...	sing..	Eismn	hand.	.....	.....	.....	.....	none.....	.....
Wichita.....R	2½	.....	144	.....	p-stl.	s-flx..	s....	36x4	36x7*	wd..	Wau..	4-3½x5½-22.5	4	cent...	Perf..	zz-t-c...	sing..	Eismn	hand.	.....	.....	.....	l-b...	Wau....	motor.
Wichita.....O	3½	.....	165	.....	p-stl.	s-flx..	s....	36x5	36x5d	wd..	Wau..	4-4½x5½-32.4	2	cent...	E-M..	sq-t-s...	sing..	Eismn	hand.	.....	.....	.....	cent..	Wau....	motor.
Wichita.....Q	5	.....	165	.....	p-stl.	s-flx..	s....	36x6	38x6d	wd..	Wau..	4-4½x5½-32.4	2	cent...	E-M..	sq-t-s...	sing..	Eismn	hand.	.....	.....	.....	cent..	Wau....	motor.
Wilcox.....S	1	.....	128	Smth..	p-stl.	s-flx.	opt..	35x5*	35x5*	wd..	Con..	4-3½x5 -22.5	4	ther....	Perf..	zz-t-ps...	sing..	Bosch.	hand.	ltg 2..	West..	.....	cent..	Pierce...	motor.
Wilcox.....X	1½	.....	144	Smth..	p-stl.	s-flx	s....	36x4	36x5	wd..	own..	4-4½x5 -28.9	4	cent...	Perf..	zz-t-ps...	sing..	Bosch.	hand.	ltg 2..	West..	.....	cent..	Pierce...	motor.
Wilcox.....Q	2	.....	150	Smth..	p-stl.	s-flx.	s....	36x4	36x3½d	wd..	own..	4-4½x5 -32.4	2	cent...	Perf..	zz-t-c...	sing..	Bosch.	hand.	ltg 2..	West..	.....	cent..	Pierce...	motor.
Wilcox.....P	3½	.....	154	Smth..	p-stl.	s-flx.	s....	36x5	36x5d	wd..	own..	4-4½x5 -28.9	2	cent...	Perf..	zz-t-c...	sing..	Bosch.	hand.	ltg 2..	West..	.....	cent..	Pierce...	motor.
Wilcox.....W	5	.....	162	Smth..	p-stl.	s-flx.	s....	36x5	40x6d	c-s..	Wau..	4-4¾x6½-36.1	2	cent...	Perf..	fin-cst...	sing..	Bosch.	hand.	.....	none..	.....	cent..	Wau....	motor.
Wilson.....	2	2,550	144	.....	rol-c.	flex..	s....	36x4	36x4d	wd..	Con..	4-4½x5½-27.2	4	cent...	Long.	fin-cst...	sing..	Eismn	fix..	opt...	opt.....	.....	cent..	Pierce...	motor.
Wilson.....	3½	3,250	156	.....	rol-c.	flex..	s....	36x5	36x5d	wd..	Con..	4-4½x5½-32.4	2	cent...	Long.	fin-cst...	sing..	Eismn	fix..	opt...	opt.....	.....	cent..	Pierce...	motor.
Wilson.....	5	.....	156	.....	rol-c.	s-flx..	s....	36x6	40x6d	wd..	.....	4-4½x5½-32.4	2	cent...	.....	fin-cst...	sing..	Eismn	fix..	opt...	opt.....	.....	cent..	Pierce...	motor.
Winther.....47	2	2,800	150	.....	rol-c.	s-flx.	s....	36x4	36x7	wd*	Wis..	4-4 x6 -25.6	4	cent...	Bre..	tub-cst...	sing..	Eismn	hand.	opt...	Bijur..	.....	cent..	Duplex..	motor.
Winther.....67	3	3,600	150	.....	rol-c.	s-flx.	s....	36x4	36x5d*	wd*	Wis..	4-4 x6 -25.6	4	cent...	Bre..	tub-cst...	sing..	Eismn	hand.	opt...	Bijur..	.....	cent..	Duplex..	motor.
Winther.....87	4	4,000	156	.....	rol-c.	s-flx.	s....	36x5	40x5d*	c-s.	Wis..	4-4½x6 -28.9	4	cent...	Bre..	tub-cst...	sing..	Eismn	hand.	opt...	Bijur..	.....	cent..	Duplex..	motor.
Winther.....107	5	4,600	162	.....	rol-c.	s-flx.	s....	36x5	40x6d*	c-s.	Wis..	4-4½x5½-36.1	2	cent...	Bre..	tub-cst...	sing..	Eismn	hand.	s&l...	Bijur..	.....	cent..	Duplex..	motor.
Winther.....127	6	5,000	162	.....	rol-c.	s-flx.	s....	36x6	40x6d*	c-s.	Wis..	4-5½x5½-42.0	2	cent...	Bre..	tub-cst...	sing..	Eismn	hand.	s&l...	Bijur..	.....	cent..	Duplex..	motor.
Wisconsin.....B	1½	1,650	136	Smth..	p-stl.	rigid.	s....	34x4	34x6	wd..	Wau..	4-3½x4 -19.6	4	cent...	Chgo	cel-sht...	sing..	Eismn	hand.	.....	.....	.....	cent..	Wau....	motor.
Wisconsin.....C	2½	2,500	156	Smth..	p-stl.	rigid.	s....	36x4	36x6	wd..	Wau..	4-4 x5½-25.6	2	cent...	Chgo	cel-sht...	sing..	Eismn	hand.	.....	.....	.....	cent..	Wau....	motor.
Witt-Will.....WD-16	1	2,000	120	.....	p-stl.	flex..	s*...	36x3*	36x4*	wd..	Con..	4-3½x5½-22.5	4	cent...	Natl.	s-t-sht...	sing..	Eismn	auto.	.....	none..	.....	cent..	Pierce...	motor.
Witt-Will.....WD-18	2½	2,500	144	.....	p-stl.	s-flx..	s*...	36x3½*	36x3½d*	wd..	Con..	4-4¼x5¼-27.2	4	cent...	Natl.	cel-sht...	sing..	Eismn	auto.	.....	none..	.....	cent..	Pierce...	motor.

Steam Vehicles

Name and Model	Capacity in Pounds	Price of Chassis	Wheelbase in Inches	FRAME		TIRES			Wheels	BOILER						WATER		
				Material	Construction	Kind	SIZES IN INCHES Front	SIZES IN INCHES Rear		Location	Type	Heating Surface in Sq. In.	Horsepower	BURNER Type	BURNER Regulation	PRESSURE Normal in Lbs.	PRESSURE Maximum in Lbs.	Water Capacity in Gal.	CONDENSER Type	CONDENSER Circulation
Steamotor....	4,000	$3,000	144	p-stl....	.....	s.....	36x4	36x6	wood...	under hood	Doble...	21,600	45	carb....	auto....	600	.....	25	fin-sht...	.....

ABBREVIATIONS—Types of Construction

*Other Options
amid—amidships
auto—automatic
c—center
c&l—center and left
c-s—cast steel
cent—centrifugal
cel-cst—cellular cor cast case
cel-sht—cellular core sheet case
cylinders cast, 2 in pairs
cylinders cast, 4 in block
cylinders cast, 3 in threes
cylinders cast, 1 singly
d—dual
d-d—dry disk
d-p—dry plate
d-rd—double reduction
elec—electric
ext-dst—external drive-shaft
ext-f-s—external front wheels.
ext-jst—external jack-shaft
ext-r-w—external rear wheel
fab—fabric
fin-sht—finned tube core sheet case
fix—fixed
flex—flexible
fric—friction
grav—gravity
gset—gearset
hyd—hydraulic
ind-c—individual clutch
int-dst—internal drive-shaft
int-f-w—internal front wheels
in-g—internal gear
in-g-4—internal gear drive on 4 wheels
int-r-w—internal rear wheel
jst—unit with jackshaft
l—left
ltg—lighting
metl—metal
mtr—unit with motor
opt—optional
pist—piston pump
plan—planetary
pnu—pneumatic
pres—pressure
prog—progressive sliding gear
p-stl—pressed steel
r—right
r-a—unit with rear axle
ring-cst—ring core cast case
rol-c—rolled channel
rol-i—rolled I-beam
r-rd—radius rods
selec—selective sliding gear
s-flx—semi-flexible
s & l—starting and lighting
s, l & i—starting, lighting and ignition
s, l & i 2—starting, lighting and ignition two-unit
sing—single
s—solid
spgs—springs
sq-t-sht—square tube core sheet case
stk—stock
sub-f—sub-frame
ther—thermo-syphon
tor-a—torque arm
tor-t—torsion tube
vacm—vacuum
wd—wood
w-d—multiple disk in oil
worm—top worm
w-p—wet plate
zz-t-sht—zig-zag tube core sheet case

Prices are exclusive of the 3 per cent. Government war tax

Commercial Vehicles for 1918—Concluded

ENGINE				TRANSMISSION											BRAKES		CONTROL			UNIVERSALS		
SPEED		FUEL SYS.		CLUTCH		GEARSET				FINAL DRIVE							STEERING GEAR					
Motor in R.p.m.	Truck in M.p.h.	Carbureter Make	Fuel Feed	Type	Make	Type	Make	Placed	Speeds	Type	Axle Make	Total Gear Reduction in High	Propulsion Taken By	Torque Taken By	Make of Springs	Foot	Hand	Placed	Make	Levers	Type	Make	Name and Model
1,200	15	Schblr..	grav..	d-d...	Fuller..	selec...	Fuller..	mtr...	3	in-g...	Russl..	7.8	spgs...	spgs...	Mathr..	int-r-w.	ext-r-w.	r....	Ross..	c....	.....	.....	Union.....B
1,160	15	Stmbg..	grav..	cone..	Hartfd.	ind-c...	Cotta..	amid..	3	worm.	own....	8.2	r-rd....	.....	Tut....	int-r-w.	ext-jst.	l....	Lavn..	c....	metl...	Hart*.	U. S.....E
1,200	15	Stmbg..	grav..	cone..	Hartfd.	ind-c...	Cotta..	amid..	3	worm.	Shel...	8.7	spgs...	spgs...	Shel...	int-r-w	int-r-w.	l....	Lavn..	c....	metl...	Hart*.	U. S.....H
1,090	13	Stmbg..	grav..	cone..	Hartfd.	ind-c...	Cotta..	amid..	3	worm.	own....	8.0	r-rd....	.....	Tut....	int-r-w	ext-j-s.	l....	Lavn..	c....	metl...	Hart*.	U. S.....D
1,090	12	Stmbg..	grav..	cone..	Hartfd.	ind-c...	Cotta..	amid..	3	chn...	Shel...	11.7	r-rd....	.....	Shel...	int-r-w	int-r-w.	l....	Lavn..	c....	metl...	Hart*.	U. S.....J
950	12	Stmbg..	grav..	d-p...	B-Beck.	ind-c...	Cotta..	amid..	3	worm.	Shel...	8.8	r-rd....	spgs...	Shel...	int-r-w	int-r-w.	l....	Lavn..	c....	metl...	Hart*.	U. S.....K
1,125	14	Stmbg..	grav..	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	3	worm.	Shel...	8.6	.....	spgs...	spgs...	int-r-w	int-r-w.	.....	Gem...	.....	.....	.....	United.....BSW
980	12	Stmbg..	grav.	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	3	worm.	Shel...	8.7	.....	spgs...	spgs...	int-r-w	int-r-w.	.....	Gem...	.....	.....	.....	United.....CSW
980	12	Stmbg..	grav.	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	3	worm.	Shel...	8.7	.....	spgs...	spgs...	int-r-w	int-r-w.	.....	Gem...	.....	.....	.....	United.....DSW
897	10	Zenith..	grav.	d-d...	B-Lipe.	selec...	B-Lipe.	amid..	4	worm.	Shel...	11.7	.....	spgs...	spgs...	int-r-w	int-r-w.	.....	Ross..	.....	.....	.....	United.....ESW
.....	.....	Zenith..	grav.	.....	Muncie	selec...	Muncie	mtr...	4	in-g...	.....	9.0	.....	r-rd...	.....	int-r-w	int-r-w.	.....	Ross..	.....	.....	.....	.....
1,110	12	Rayfld.	grav.	w-d...	M-Evn.	ind-c...	Cotta..	amid.	3	bevl-4.	own....	9.0	spgs...	spgs...	Std....	int-r-w.	ext-dst	r....	Lavn..	r....	.....	.....	United F. W. D.....B
.....	.....	Zenith..	grav.	d-p...	own....	selec...	own....	mtr...	3	worm.	own....	.....	r-rd....	tor-a...	Kal....	int-r-w.	int-r-w.	l....	Lavn..	c....	.....	.....	Universal.....G
1,100	12	Zenith..	grav.	d-d...	own....	selec...	own....	amid.	3	chn...	own....	.....	r-rd....	.....	Kal....	int-....	int-....	r....	Lavn..	r....	.....	.....	Universal.....D
1,100	12	Zenith..	grav.	d-d...	own....	selec...	own....	amid.	3	chn...	own....	.....	r-rd....	.....	Kal....	int-r-w.	int-dst..	r....	Lavn..	r....	.....	.....	Universal.....L
1,008	18	Stmbg..	vacm..	d-p...	own....	selec...	B-Lipe.	amid.	4	worm.	Timkn.	6.0	spgs...	spgs...	Mthr...	int-r-w.	int-r-w.	r....	Gem...	c....	metl...	Spicer..	Velie.....25A
1,215	14	Stmbg..	vacm..	d-d...	own....	selec...	B-Lipe.	amid..	4	worm.	Timkn.	10.3	r-rd....	spgs...	Mthr...	int-r-w.	int-r-w.	r....	Gem...	c....	metl...	Spicer..	Velie.....26A
.....	.....	Zenith..	grav.	one...	own....	selec...	own....	mtr...	3	bevel.	W-W....	.....	spgs...	spgs...	Shel...	int-r-w.	ext-r-w.	l....	Jacx...	c....	metl...	Spicer..	Vim.....21
1,000	50	H-N....	grav.	d-p...	own....	selec...	own....	amid..	4	in-g-4.	own....	8.0	spgs...	spgs...	Merl...	ext-dst	int-r-w.	l....	own...	c....	.....	.....	Walter.....F
11,000	11	Zenith..	grav.	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	4	worm.	Timkn.	10.3	r-rd....	spgs...	Shel...	int-r-w.	int-r-w.	r....	Gem...	c....	metl...	Spicer.	Watson.....Tractor
1,000	12	Stmbg..	grav.	d-d...	.....	selec...	.....	amid.	3	bevel.	.....	9.8	spgs...	spgs...	.....	ext-...	ext-...	l....	.....	c....	.....	.....	Ware.....
1,100	12	Stmbg..	vacm..	d-d...	Warner	selec...	Warner	amid..	4	chn...	Timk*..	13.6	r-rd....	.....	G-C...	int-r-w.	ext-dst	l....	Ross..	c....	metl...	K-B...	Western.....
.....	.....	own....	grav.	w-p...	own....	selec...	own....	amid.	4	bevel.	qwn....	.....	r-rd....	spgs...	.....	int-r-w.	ext-r-w.	l....	own...	c&l.	.....	.....	White.....GBBE
.....	.....	own....	grav.	w-p...	own....	selec...	own....	amid.	4	d-rd..	own....	.....	r-rd....	spgs...	.....	int-r-w.	ext-r-w.	l....	own...	c&l.	.....	.....	White.....TBC
.....	.....	own....	grav.	w-p...	own....	selec...	own....	amid.	4	chn...	own....	.....	r-rd....	.....	.....	int-r-w.	ext-jst.	l....	own...	c&l.	.....	.....	White.....TAD
.....	.....	own....	grav.	w-p...	own....	selec...	own....	amid.	4	chn...	own....	.....	r-rd....	.....	.....	int-r-w.	ext-jst.	l....	own...	c&l.	.....	.....	White.....TCD
1,100	15	Stmbg..	vacm..	d-d...	Fuller..	prog...	Fuller..	mtr...	3	worm.	Timkn.	.....	spgs...	spgs...	Shel...	int-r-w.	int-r-w.	r....	Ross..	c....	.....	.....	White-Hickory.....H
1,085	15	Stmbg*	grav.	cone..	own....	selec...	Covert.	jst....	3	chn...	Shel...	7.3	r-rd....	.....	Shel*..	in-tr-w.	int-jst.	r....	Ross..	c....	.....	.....	Wichita.....A
1,090	15	.....	grav.	cone..	own....	selec...	Covert.	amid.	3	worm.	Shel...	7.8	spgs...	spgs...	Shel*..	int-r-w.	int-r-w.	r....	Ross..	c....	.....	.....	Wichita.....K
.....	.....	Stmbg*	grav.	cone..	own....	selec...	Covert.	amid.	3	worm.	Shel...	10.7	spgs...	spgs...	Shel*..	int-r-w.	int-r-w.	r....	Ross..	c....	.....	.....	Wichita.....L
1,060	13	Stmbg*	grav	cone..	own....	selec...	Covert.	jst....	3	chn...	Shel...	8.2	r-rd....	.....	Shel*..	int-r-w.	int-jst..	r....	Ross	c....	.....	.....	Wichita.....B
1,300	13	Stmbg*	grav.	cone..	own....	selec...	Covert.	amid.	3	worm.	Shel...	10.3	spgs...	spgs...	Shel*..	int-r-w.	int-r-w.	rr....	Ross..	c....	.....	.....	Wichita.....R
1,200	11	Stmbg*	grav.	cone..	Hart....	selec...	B-Lipe.	amid.	4	worm.	Shel...	11.7	spgs...	spgs...	Shel*..	int-r-w.	int-r-w.	r....	Ross..	c....	.....	.....	Wichita.....O
1,200	10	Stmbg*	grav.	cone..	Hart....	selec...	B-Lipe.	amid.	4	worm.	Shel...	13.0	spgs...	spgs...	Shel*..	int-r-w.	int-r-w.	r....	Ross..	c....	.....	.....	Wichita.....Q
1,200	18	Stmbg..	grav.	d-d...	B-Lipe*	selec...	B-Lipe*	mtr...	3	worm.	Shel...	6.5	spgs...	spgs...	Shel...	int-r-w.	int-r-w.	l....	Gem...	c....	metl...	Spicer.	Wilcox.....S
1,100	16	Stmbg..	grav.	cone..	own....	selec...	own....	amid.	3	worm.	Shel...	7.7	spgs...	spgs...	Shel...	int-r-w.	int-r-w.	l....	Gem...	c....	metl...	Wilcx*	Wilcox.....X
1,100	14	Stmbg..	grav.	cone..	own....	selec...	own....	amid.	3	worm.	Shel...	8.6	spgs...	spgs...	Shel...	int-r-w.	int-r-w.	l....	Gem...	c....	metl...	Wilcx*	Wilcox.....Q
1,100	10	.....	grav.	cone..	own....	selec...	own....	amid.	3	worm.	Shel...	11.7	spgs...	spgs...	Shel...	int-r-w.	int-r-w.	l....	Gem...	c....	metl...	Wilcx*	Wilcox.....P
1,000	14	Stmbg..	vacm..	cone..	own....	selec...	own....	amid.	4	worm.	Shel...	8.7	spgs...	spgs...	Shel...	int-r-w.	int-r-w.	l....	Gem...	c....	metl...	Spicer*	Wilcox.....W
1,140	14	Marvel.	grav.	cone.	Hart....	selec...	Covert.	amid.	3	worm	Shel...	8.6	spgs...	spgs...	Shel...	int-r-w.	int-r-w.	l....	Ross..	c....	.....	.....	Wilson.....
1,100	12	Marvel.	grav.	d-d...	B-Beck.	selec...	Covert.	amid.	4	worm	Shel...	8.7	spgs...	spgs...	Shel...	int-r-w.	int-r-w.	l....	Ross..	c....	.....	.....	Wilson.....
1,100	10	Marvel.	grav.	cone..	.....	selec...	.....	amid.	4	worm.	.....	13.0	spgs...	spgs...	.....	int-r-w.	int-r-w.	l....	.....	c....	.....	.....	Wilson.....
1,100	15	Master.	vacm..	d-p...	B-Beck.	prog...	own...	amid.	4	in-g...	Celf....	.....	spgs...	spgs...	Mthr...	int-r-w.	ext.....	r....	Ross..	c....	metl...	Blood*	Winther.....47
1,300	14	Master.	vacm..	d-p...	B-Beck.	prog...	own...	amid.	4	in-g...	Celf....	10.0	spgs...	spgs...	Mthr...	int-r-w.	ext.....	r....	Ross..	c....	metl...	Blood*	Winther.....67
1,300	12	Master.	vacm..	d-p...	B-Beck.	prog...	own...	amid.	4	in-g...	Celf....	12.5	spgs...	spgs...	Mthr...	int-r-w.	int.....	r....	Ross..	c....	metl...	Blood*	Winther.....87
1,100	10	Master.	vacm..	d-p...	B-Beck.	prog...	own...	amid.	4	in-g...	Celf....	12.5	spgs...	spgs...	Mthr...	int-r-w.	int.....	r....	Ross..	c....	metl...	Blood*	Winther.....107
1,100	10	Master.	vacm..	d-p...	B-Beck.	prog...	own...	amid.	4	in-g...	Celf....	.....	spgs...	spgs...	Mthr...	int-r-w.	int-r-w.	r....	Ross..	c....	metl...	Blood*	Winther.....127
.....	16	Master.	grav.	d-d...	Fuller..	selec...	Fuller..	mtr...	3	worm.	Shel...	.....	spgs...	spgs...	Shel...	int-r-w.	int-r-w.	l....	Lavn..	c....	metl...	Blood..	Wisconsin.....B
.....	15	Master.	grav.	d-d...	Fuller..	selec...	Fuller..	mtr...	3	worm.	Shel...	.....	spgs...	spgs...	Shel...	int-r-w.	int-r-w.	l....	Lavn..	c....	metl...	Blood..	Wisconsin.....C
.....	.....	Zenith..	grav.	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	3	worm.	Timkn.	3.0	spgs...	spgs...	.....	int-r-w.	int-r-w.	l....	Ross..	c....	metl...	Spicer.	Witt-Will.....D16
1,000	14	Zenith..	grav.	d-d...	B-Lipe.	selec...	B-Lipe.	mtr...	3	worm.	Timkn.	7.7	spgs...	spgs...	Shel...	int-r-w.	int.....	l....	Ross..	c....	metl..	Spicer.	Witt-Will.....WD18

Steam Vehicles

SYSTEM		ENGINE							TRANSMISSION					CONTROL					Name and Model
Feed Pump Type	Feed Control	Location	No. of Cylinders	Cylinders Cast	Valve Location	Valve Action	Valve Stroke	Reverses By	Final Drive	Gear Ratio	Axle Type	Propulsion Taken By	Torque Taken By	Throttle	Hook-up	Reverse	Steering Wheel Location	Brake Lever Location	
.....	.....	u-seat..	2	singly...	front....	Stephenson.	adj....	links.....	worm*.	7.75	full-fl...	springs....	springs..	lever....	pedal...	pedal...	left.....	left.....	Steamotor...

ABBREVIATIONS—Makers of Parts

*Other Options
A-K—Atwater-Kent
Aut-L—Auto-Lite
B-Beck—Borg & Beck
B-Lipe—Brown-Lipe
Blng—Berling
Brm—Bremer
Bud—Buda
Can—Candler
Celfr—Celfor
Chgo—Chicago
Con—Continental
Conn—Connecticut
Dtrt—Detroit
Dynt—Dyneto
Eismn—Eisemann
E-M—English & Mersick
Eur—Eureka
Fed—Fedders
Franck—Francke
G&O—G & O Mfg. Co.
GBS—Golden, Belknap & Swartz
G-C—Garden City
Gem—Gemmer
Har—Harrison
Hart—Hartford
Hays—Hayes
Hig—Higgins
H-Shaw—Hele-Shaw
H-S—Herschell-Spillman
Idl—Ideal
Iron—Iron City
Jacx—Jackson-Church-Wilcox
Jhnson—Johnson
Kal—Kalamazoo
K-B—Kinsler-Bennett
Key-H—Keystone-Hindley
Lavn—Lavigne
LeR—LeRol
Lgt—Light
Ligt—Liggett
Lyc—Lycoming
M'C—McCord
Merl—Merrill
Mil—Milwaukee
Mnrch—Monarch
Mthr—Mather
Natl—National
N. A.—North American
P & B—Parish & Bingham
Perf—Perfection
Prsh—Parish
R-T—Rome-Turney
Rayfld—Rayfield
Rowl—Wm. Harvey Rowland
Russl—Russel
Rut—Rutenber
Salsby—Salisbury
Savg—Savage Arms
Schblr—Schebler
Shel—Sheldon
Shkspr—Shakespeare
Smth—A. O. Smith
S-P—Spring-Perch
Spltf—Splitdorf
Stewrt—Stewart
Stmbg—Stromberg
Sundmn—Sunderman
S-W—Sparks-Withington
Ther—Thermoid
Timkn—Timken
Torb—Torbenson
Tut—Tuthill
Univ—Universal Machine Co.
Wau—Waukesha
Wilcx—Wilcox
Wis—Wisconsin

Prices are exclusive of the 3 per cent. Government war tax

Technical Specifications of 31 Electric the American Market

Ten Electric Industrial Trucks

Name and Model	Load Capacity in Pounds	PRICE OF CHASSIS		Wheelbase in Inches	TIRES			BATTERY							MOTOR	
		With Battery	Without Battery		Kind	SIZES IN INCHES		Location	Make and Type	No. Plates	No. Cells	No. Trays	Amp.-Hr. Capacity	MILES PER CHARGE	Location and Number	Make
						Front	Rear							Light / Loaded		
C.T.	1,000		1,600	90	solid	36x3	36x3	amid-u	Edison-A5*		60*	6*	187½*	50*	unit-x-2	G.E.
C.T.	2,000		1,950		solid	36x3½	36x4	amid-u	Edison-A6*		60*	6*	225*	45*	unit-x-2	G.E.
C.T.	4,000		2,350	116	solid	36x	36x d	amid-u	Edison-A8*		60*	8*	300*	50*	unit-x-2	G.E.
C.T.	7,000		3,350	123	solid	36x3½d*	36x4d	amid-u	Edison-A10*		60*	8*	375*	40*	unit-w-4	G.E.
C.T.	10,000		3,800	132	solid	36x4d*	36x5d	amid-u	Edison-A12*		60*	8*	450*	40*	unit-w-4	G.E.
Couple Gear A	10,000	5,500	4,800	96	solid	36x5d	36x5d	amid-u	Philadelphia	29	44	8	350	35 / 30	in wheel-4	own
Couple Gear ALDF	14,000	5,000	4,300	96	s&stl	36x5d	64x5	amid-u	Philadelphia	29	44	8	350	35 / 30	in wheel-2	own
Couple Gear ACDF	14,000	6,000	5,200	94	s&stl	36x5d	64x6	amid-u*	Philadelphia	29	44	8	350	35 / 30	in wheel-2	own
G.V.	1,000			89½	solid	36x3½	36x2½	amid-u	Edison-A4*	9*	60*	6*	150*	45	in rear-1	G.E.
G.V.	2,000			104	solid	36x3½	36x3½	amid-u	Edison-A6*		60*	6*		50*	in-rear 1	G.E.
G.V.	4,000			112½	solid	36x4	36x3d	amid-u	Edison-A8*		60*	12*	300*	45	in rear-1	G.E.
G.V.	7,000			132½	solid	36x6	36x4d	amid-u	Edison*		60*	12*	375*	40	in rear-1	G.E.
G.V.	10,000			141½	solid	36x7	36x5	amid-u	Edison*		60*	6*		35	in rear-1	G.E.
Lansden M	4,000			120	solid	36x4	36x3d	amid-u	Ironclad					50 / 40	unit-j-1	G.E.
Lansden M	7,000			130	solid	36x5	36x4d	amid-u	Ironclad					45 / 40	unit-j-1	G.E.
Lansden M	10,000			142	solid	36x6	36x5d	amid-u	Ironclad					40 / 35	unit-j-1	G.E.
Lansden M	12,000			142	solid	36x6	36x6d	amid-u	Ironclad					40 / 30	unit-j-1	G.E.
Walker M	1,000			93*	solid	34x3	36x3½	amid-u	Edison*						unit-x-1	West.
Walker K	2,000			96*	solid	34x3½	36x4	amid-u	Edison*						unit-x-1	West.
Walker L	4,000			110	solid	38x4	38x6	amid-u	Edison*						unit-x-1	West.
Walker D	6,000			130	solid	36x5	38x4d	amid-u	Edison*						unit-x-1	West.
Walker E	8,000			144	solid	36x6	38x5d	amid-u	Edison*						unit-x-1	West.
Walker N	10,000			144	solid	36x7	38x6d	amid-u	Edison*						unit-x-1	West.
Walker Tractor 2	20,000			52	solid	34x3½	38x5	amid-o	Edison*						unit-x-1	West.
Walker Tractor 3	30,000			70	solid	34x4	38x6	amid-o	Edison*						unit-x-1	West.
Ward WS	750			88	solid	32x2½	32x2½	u-seat	Edison-G4		65	5	100	35*	amid-1	
Ward WA	1,000			90	solid	32x3	34x3½	amid-u	Edison-G7		60	6		35*	in front-1	
Ward WB	2,000			102	solid	34x3½	36x4	amid-u	Edison-G9		60	6	225	35*	in front-1	
Ward WD	4,000			114	solid	36x4	38x6	amid-u	Edison-G11		60	6	275	30*	in front-1	
Ward WF	7,000			132	solid	38x6	40x8	amid-u	Edison-G14		60	6	350	25*	in front-1	
Ward WH	10,000			144	solid	40x8	42x10	amid-u	Edison-G18		60	6	425	20*	in front-1	

Industrial Trucks

Automatic Mill				38	solid	16*x3	16*x3½	amid-o*	Edison-A4*		40*	4*	150*		in front-1	
Automatic Tract D				38	solid	16x3	16x3½	amid-o*	Edison-A4*		40*	4*	150*		in front-1	
Automatic Tract S				36	solid	16x3	16x3½	amid-o	Edison-A4*		40*	4*	150*		amid	
Automatic Tract T				38	solid			amid-u	Edison-A6*		30*	4*	225*		in front-1	
Automatic L				51	solid	10x5	16x3½	rear-o	Edison-A6*		24*	3*	225*		in rear-2	
Automatic	4,000			72	solid	27½x3	27½x3½		Edison-A6*		24*	3*	225*		unit-x-1	
Automatic	4,000			72	solid	27½x3½	27½x3½	rear-o	Edison-A6*		24*	3*	225*		unit-x-1	
Automatic H	4,000			51	solid	10x5	16x3½	rear-o	Edison-A6*		24*	3*	225*		in rear-1	
Automatic E	4,000			52	solid	16x3	16x3½	rear-o	Edison-A6*		24*	3*	225*		amid-1	
Automatic D	4,000			38	solid	16x3	16x3½	rear-o	Edison-A4*		20*		150*		in front-1	
Electromobile R	2,500			52	solid	9x5d	20x3	rear-o	Ironclad	11	15	1	158		unit-j-1	Wagner
Electromobile A	3,000			43	solid	20x3	20x3	amid-u	Ironclad*	7*	15*	1*	100*		unit-j-1	Wagner
Electromobile B	3,000			52	solid	20x3	20x3½	amid-u	Ironclad*	7*	24*	2*	100*		unit-j-1	Wagner
Electromobile CS	4,000			52	solid	20x3½	20x3½	amid-u	Ironclad*	12*	15*	1*	220*		unit-j-1	Wagner
Electromobile D	4,000			60½	solid	20x3½	20x3½	amid-u	Ironclad*	9*	24*	2*	125*		unit-j-1	Wagner
Electromobile T-E	15,000			30	solid	20x3	20x3½	front-u	Ironclad*	11*	24*	2*	158*		unit-j-1	Wagner
Electromobile T-EJ	15,000			30	solid	20x3	20x3½	front-u	Ironclad*	11*	24*	2*	158*		unit-j-1	Wagner
Elwell-Parker SA-SC-SE					solid	27½x3½	27½x3½	front-o	lead*	15*	12*		196*		front	
Elwell-Parker DD-DG					solid	27½x3½	27½x3½	front-u	lead*	15*	12*	1*	196*		front	
Elwell-Parker IB-ID					solid	15x3½	15x3½	front-u	lead*	17*	12*		192*		front	
Elwell-Parker F-W					solid	21½x3½	10½*x3½	amid-u	lead*	15*	12*		196*		front	
Elwell-Parker F-I					solid	21*x3½	10½*x5	u-hood*	lead*	15*	24*		392*		front	
Elwell-Parker					solid	21½x3½	10½x5	front-u	lead*	15*	12*		196*		front	
Elwell-Parker E					solid	21½x3½	10½x5	u-hood	lead*	15*	12*	1*	196*		front	
Lansden BB	750			90	solid*	32x3	32x3	seat-u	Ironclad					65 / 60	unit-x-1	G.E.
Lansden BB	1,000			92	solid	34x2½	34x2½	amid-u	Ironclad					65 / 60	unit-x-1	G.E.
Lansden M	1,000			96	solid	36x3½	36x3	amid-u	Ironclad					50 / 40	unit-j-1	G.E.
Lansden M	2,000			106	solid	36x3	36x3½	amid-u	Ironclad					55 / 45	unit-j-1	G.E.
Lansing Tractor C	4,000			33	solid	18x3	18x4	amid-o	Ironclad*	11*	24*	3*	157½*	35 / 20	unit-x-1	West.
Lansing Tractor H	5,000			60	solid	18x4	18x5	amid-u	Ironclad*	9*	24*	4*	126*	30 / 15	unit-x-1	West.
Lansing Tractor D	10,000			42	solid	18x3	18x5	amid-o	Ironclad*	17*	24*	6*	252*	35 / 20	unit-x-1	West.
Mercury Tractor Z		1,715	1,205	40½	solid	15x3½	20½x3½	rear-o	Edison-A6*		30*	5*			amid-1	G.E.
Mercury Tractor X		2,190	1,490	40	solid	16x3	20x3½	rear-o	Edison*						amid-1	Diehl
Transmobile EE21	4,000			66½	solid	20x3½	10x4	u-hood	Edison-A8*		24*	1	300*		amid-1	G.E.

ABBREVIATIONS—Types of Construction

*—with other options
amid—amidships
amid-o—amidships, over frame.
amid-u—amidships, undersiung below frame
btw-seats — between seats
cent—center
d—dual
front-u—in front, under frame
Her-gear—Herringbone gears
l-plat—to left of platform
l-seat—to left of seat
rad-rd—radius rods
rear-o—at rear, over frame
r-seat—to right of seat
rol-chain—roller chain
s-chain—silent chain
sp-gear-f—spur gear to front wheels
st-col—on steering column
sub-fr—sub frame
top-wm—top worm
top-wm-f—top worm to front wheels
tor-arm—torque arm
u-floor—under floor
u-hood—under hood
unit-j—unit with jackshaft
unit-x—unit with axle
u-plat—under platform
u-wheel—under steering wheel
u-seat—under seat
½-ell—½ elliptic
½-trans—½ transverse elliptic
¾-ell—¾ elliptic

ABBREVIATIONS—Parts Makers. **Ironclad**—Exide Ironclad type. **G. E.**—General Electric **West**—Westinghouse

Commercial Vehicle Chassis Listed on for the 1918 Season

Designed for Indoor Application

MOTOR					CONTROLLER			DRIVE							SPRINGS		CONTROL		
Winding	Horse-power	Voltage	SPEED IN MILES PER HOUR		Location	SPEEDS		GEARING		Total Gear-Ratio	Torque Taken By	Propul-sion Taken By			Front	Rear	Steer	Con-troller Lever	Name and Model
			Light	Loaded		Ahead	Reverse	First Reduc-tion	Final Reduc-tion										
series	2.5	85*	15	13½	st-col	4	2	spur-gear	spur-gear	10.00-1	springs*	rad-rd*	½-ell	½-ell	wheel-l	u-wheel	C.T		
series	3.2	85*	14	12	st-col	4	2	spur-gear	spur-gear	11.50-1	springs*	rad-rd*	½-ell	½-ell	wheel-l	u-wheel	C.T		
series	5.0	85*	12	10	st-col	4	2	spur-gear	spur-gear	12.14-1	springs*	rad-rd*	½-ell	½-ell	wheel-l	u-wheel	C.T		
	7.0	85*	11	9	st-col	4	2	spur-gear	spur-gear	17.32-1	springs*	rad-rd*	½-ell	½-ell	wheel-l	u-wheel	C.T		
	7.0	85*	9	7	st-col	4	2	spur-gear	spur-gear	20.14-1	springs*	rad-rd*	½-ell	½-ell	wheel-l	u-wheel	C.T		
series	12.0	88	8	6	u-seat	5	5	direct	bevel	25.00-1	springs*	rad-rd*	½-ell	½-ell	wheel-r	btw seats	Couple Gear		A
series	10.0	88	8	6	u-seat	5	5	direct	bevel	25.00-1	springs*	rad-rd*	½-ell	½-ell	wheel-r	btw seats	Couple Gear		ALDF
series	10.0	88	8	6	u-seat	5	5	direct	bevel	25.00-1	springs*	rad-rd*	½-ell	½-ell*	wheel-r	btw seats	Couple Gear		ACDF
series	2.5	85	14	12	u-seat	5	2	s-chain	rol-chn	12.92-1	tor-a	rad-rd	½-ell	½-ell	wheel-l	l-seat	G.V		
series	3.5	85	12	10	u-seat	5	2	s-chain	rol-chn	10.76-1		rad-rd	½-ell	½-ell	wheel-l	l-seat	G.V		
series	4.5	85	11	9	u-seat	5	2	s-chain	rol-chn	11.61-1	rad-rd	rad-rd	½-ell	½-ell	wheel-l	l-seat	G.V		
series	6.0	85	10	8	u-seat	5	2	s-chain	rol-chn	14.00-1	rad-rd	rad-rd	½-ell	½-ell	wheel-l	l-seat	G.V		
series	7.0	85	9	7	u-seat	5	2	s-chain	rol-chain	14.00-1	rad-rd	rad-rd	½-ell	½-ell	wheel-l	l-seat	G.V		
series		60	10	8*	in dash	4	2	bevel	rol-chn		springs	springs	½-ell	½-ell	wheel-l	u-wheel	Lansden		M
series		60	9	8*	in dash	4	2	bevel	rol-chn		springs	springs	½-ell	½-ell	wheel-l	u-wheel	Lansden		M
series		60	8	6*	in dash	4	2	bevel	rol-chn		springs	springs	½-ell	½-ell	wheel-l	u-wheel	Lansden		M
series		60	8	6*	in dash	4	2	bevel	rol-chn		springs	springs	½-ell	½-ell	wheel-l	u-wheel	Lansden		M
series		60*	16	15	u-seat	5	5	direct		17.00-1	springs	springs	½-ell	½-ell	wheel-l*	l-seat	Walker		M
series		60*	15	14	u-seat	5	5	direct		17.00-1	springs	springs	½-ell	½-ell	wheel-l*	l-seat	Walker		K
series		60*	14	13	u-seat	5	5	direct		17.00-1	springs	springs	½-ell	½-ell	wheel-l*	l-seat	Walker		L
series		60*	12	11	u-seat	5	5	direct		16.00-1	springs	springs	½-ell	½-ell	wheel-l*	l-seat	Walker		D
series		60*	11	10	u-seat	5	5	direct		16.00-1	springs	springs	½-ell	½-ell	wheel-l*	l-seat	Walker		E
series		60*	11	10	u-seat	5	5	direct		16.00-1	springs	springs	½-ell	½-ell	wheel-l*		Walker		N
series		60*	10	6	u-seat	5	5	direct			springs	springs	½-ell	½-ell	wheel-l*	l-seat	Walker Tractor		2
series		60*	10	6	u-seat	5	5	direct			springs	springs	½-ell	½-ell	wheel-l*	l-seat	Walker Tractor		3
series		80		10*	u-floor	5	2	direct	sp-bev		springs	springs	½-ell	½-ell	wheel-l	u-wheel	Ward		WS
series		60		10*	u-seat	4	2	none	worm		springs	springs	½-ell	½-ell	wheel-l	l-seat	Ward		WA
series		60		10*	u-seat	4	2	none	worm		springs	springs	½-ell	½-ell	wheel-l	l-seat	Ward		WB
series		60		8½*	u-seat	4	2	none	worm		springs	springs	½-ell	½-ell	wheel-l	l-seat	Ward		WD
series		60		6*	u-seat	4	2	none	worm		springs	springs	½-ell	½-ell	wheel-l	l-seat	Ward		WF
series		60		6*	u-seat	4	2	none	worm		springs	springs	½-ell	½-ell	wheel-l	l-seat	Ward		WH

Industrial Trucks

series		48*			b-seat	3	3	s-chain*	rol-chain	12.25-1	springs	springs	coil	coil	wheel-l	l-seat	Automatic		Mill
series		48*			in dash	3	3	s-chain*	rol-chain	12.25-1	springs		coil	coil	lever-r	right	Automatic Tract		D
series		48*			b-seat	3	3	s-chain*	rol-chain	12.25-1	tor-arm	tor-arm	coil	coil	lever-r	l-seat	Automatic Tract		S
series		48*			u-seat	3	3	worm	worm	14.33-1					lever-r	r-seat	Automatic Tract		T
series		48*			in dash	3	3	spur gear	spur gear	10.00-1					lever-l	right	Automatic		L
series		48*			u-plat	3	3	worm	worm	14.33-1	tor-arm	tor-arm			lever-l	right	Automatic		
series		48*			u-plat	3	3	worm	worm	14.33-1					lever-l	right	Automatic		
series		48*			in dash	3	3	spur gear	spur gear	10.00-1	springs*	springs			lever-l	right	Automatic		H
series		48*			in dash	3	3	s-chain*	rol-chain	12.25-1	tor-arm	springs	coil	coil	lever-r	left	Automatic		E
series		48*			in dash	3	3	s-chain*	rol-chain	12.00-1		springs	coil	coil	lever-r	left	Automatic		D
series		30	5	4	o-frame	4	4	s-chain	rol-chain	14.00-1				coil	lever-r	left	Electromobile		R
series		30	5	4	u-plat	4	4	s-chain	rol-chain	14.00-1			coil	coil	lever-r	left	Electromobile		A
series		50	8	7	u-plat	4	4	s-chain	rol-chain	14.00-1			coil	coil	lever-r	left	Electromobile		B
series		30	5	4	u-plat	4	4	s-chain	rol-chain	14.00-1			coil	coil	lever-r	left	Electromobile		CS
series		50	8	7	u-plat	4	4	s-chain	rol-chain	14.00-1			coil	coil	lever-r	left	Electromobile		D
series		50	8	7	u-plat	4	4	s-chain	rol-chain	14.00-1			coil	coil	lever-r	left	Electromobile		T-E
series		50	8	7	u-plat	4	4	s-chain	rol-chain	14.00-1			coil	coil	lever-r	l-seat	Electromobile		T-EJ
series		24			in dash	3	3	none*	top wm-f*						lever-r	left	Elwell-Parker		SA-SC-SE
series		24			in dash	3	3	none*	top wm-f*						lever-r	left	Elwell-Parker		DD-DG
		24			in dash	3	3	none*	top worm						lever-r	left	Elwell-Parker		IB-ID
		24				3	3	spur-gear	sp-gear-f						lever-r	left	Elwell-Parker		F-W
series		24			in dash	3	3	none*	top wm*						lever-r	left	Elwell-Parker		F-I
series		24				3	3	spur gear	sp-gear						lever-r	left	Elwell-Parker		
series		24			in dash	3	3	sp-gear	sp-gear-f						lever-r	left	Elwell-Parker		E
series		48	16	15	in dash	4	2	direct	Her-gear		tor-arm	springs	½-ell	½-ell	wheel-l	u-wheel	Lansden		BB
series					in dash	4	2	direct	Her-hear		tor-arm	springs	½-ell	½-ell	wheel-l	u-wheel	Lansden		BB
series		60	14	12	in dash	4	2	bevel gr	rol-chn		springs	springs	½-ell	½-ell	wheel-l	u-wheel	Lansden		M
series		60	12	10*	in dash	4	2	bevel gr	rol-chn		springs	springs	½-ell	½-ell	wheel-l	u-wheel	Lansden		M
series		48	7½	4	u-seat	4		none	worm	10.00-1	sub-fr	sub-fr	½-ell	none	wheel-r*	l-seat*	Lansing Tractor		C
series		48	7½	4	u-seat	4	4	none	worm	10.00-1	tor-arm	springs	½-ell	½-ell	wheel-r*	l-seat*	Lansing Tractor		H
series		48	7½	4	u-seat	4	4	none	worm	10.00-1	sub-fr	sub-fr	½-ell	none	wheel-r*	l-seat*	Lansing Tractor		D
series		32	6½		u-seat	3	2		worm	17.50-1	sub-fr	sub-fr	none	none	lever-r	btw seats	Mercury Tractor		Z
series		42	8		u-seat	3	3		worm	17.00-1	tor-arm	tor-arm	½-trans	½-ell	lever-	r-seat	Mercury Tractor		X
series	2	24	7		st-col	3	3	bevel	bevel	17.00-1					wheel-		Transmobile		EE21

ABBREVIATIONS—Types of Construction

*—with other options
amid—amidships
amid-o—amidships, over frame.
amid-u—amidships, undersiung below frame
btw-seats — between seats
cent—center
d—dual
front-u—in front, under frame
Her-gear—Herringbone gears
l-plat—to left of platform
l-seat—to left of seat
rad-rd—radius rods
rear-o—at rear, over frame
r-seat—to right of seat
rol-chain—roller chain
s-chain—silent chain
sp-gear-f—spur gear to front wheels
st-col—on steering column
sub-fr—sub frame
top-wm—top worm
top wm-f—top worm to front wheels
tor-arm—torque arm
u-floor—under floor
u-hood—under hood
unit-j—unit with jack shaft
unit-x—unit with axle
u-plat—under platform
u-wheel—under steering wheel
u-seat—under seat
½-ell—½ elliptic
½-trans—½ transverse elliptic
¾-ell—¾ elliptic

ABBREVIATIONS—Parts Makers. **Ironclad**—Exide Ironclad type. **G. E.**—General Electric. **West**—Westinghouse.

Packard Starts New Service School

WITH 58,000 dealer and repair establishments in the United States, makers are becoming keenly interested in the mechanical knowledge and ability of the workers in these plants and particularly in their ability to give efficient service to car owners. Several have already inaugurated schools at the factories where service managers and employes can be taught the mechanism and service principles pertaining to each particular product. Among these is the Packard Motor Car Co. which has just opened a new technical service school to provide technically trained men for service positions, and thus hopes to solve the problem of providing trained men for its service stations.

In the selection of students the company gives consideration to the following factors: Mechanical ability, health, personality, physical balance, approach, quickness, judgment-tact, affability, reasonableness, honesty, decision, and resource.

The plan of operating the school allows a living wage to all students enrolled regardless of age, and allows for increases in the earnings, based upon:

1. Usefulness to the company while learning.
2. Previous application to similar problems.
3. Previous experience in mechanics.
4. Previous technical education and training.

The school will also attempt to fit workers for factory positions as well as for field service. The school curriculum is divided into three sections: mechanical training and underlying principles; mental training for independence of thought for solving service problems, and general business training to give better perspective.

Night School for Theory

A night school division is also in operation where the service student can also take up draftsmanship, mathematics and allied subjects thus allowing the pupil to secure practical and theoretical study by day and higher education by night. Courses in the school are conducted by the technical service department with a supervisor responsible for the administration. Men of every age and nationality are accepted. The majority have had from 3 years to 10 years of experience before enrollment. Attendance at lectures is required from all students and written examinations are given frequently allowing for the grading of students according to their ability so that the pupils quick to learn are not retarded by others of lesser perception.

Double Reduction Rear Axles

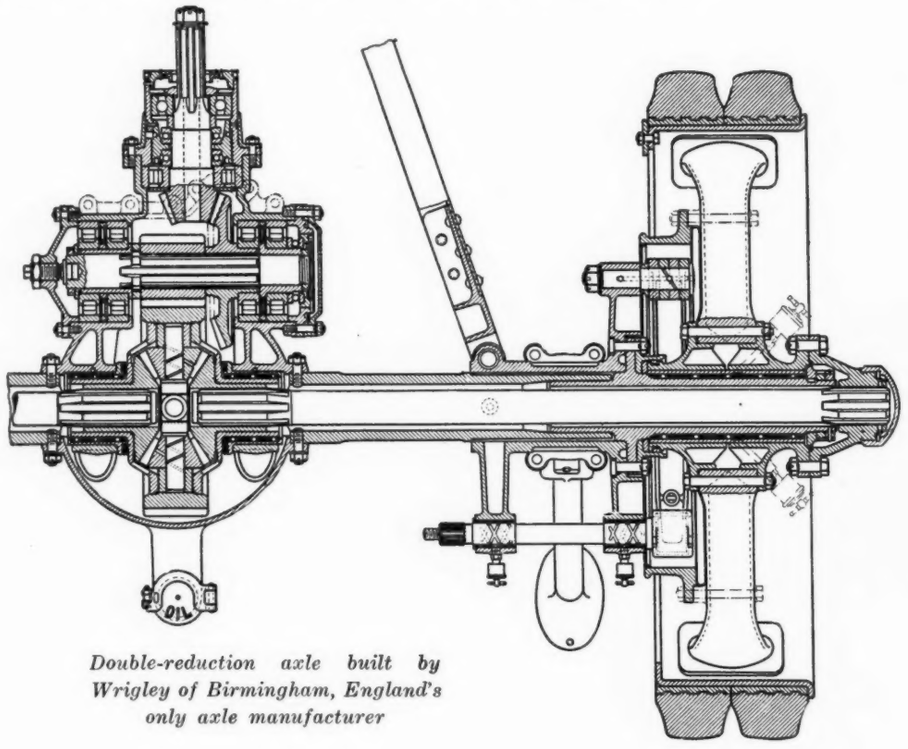
(*Continued from page 772*)

the differential a rather low speed device and necessitates making it comparatively large. In the Pagefield axle the differential is placed on the intermediate shaft. It is driven from the propeller shaft through a pair of bevel gears and it drives to the rear axle shaft through two pairs of spur gears. The axle housing is of banjo form, the banjo being placed vertically. The gear carrier is secured to the banjo on the rear side, but, of course, it does not carry the bevel pinion. The construction of the housing in this case is rather complicated, as the gear carrier is split at an angle through the axis of the intermediate shaft, and the part that bolts to the forward side of the banjo also requires considerable machining. One point about the Pagefield is that the intermediate shaft is very strongly supported, there being roller bearings on each side of each spur pinion. The arrangement by which the differential is carried on the intermediate shaft is particularly suited for axles intended for heavy loads.

The above review gives a good idea of what has been done in the development of double reduction axles both here and abroad. It seems rather remarkable, in view of the advantages possessed by the double reduction drive, that no axle of this type has yet been placed on the American market by a parts maker. The outstanding advantage is that the whole of the speed-reducing mechanism is in one place and can be completely inclosed and effectively lubricated. The drive involves only well known mechanical elements which every well equipped machine shop can produce. The double reduction drive is less sensitive to neglect than some other forms of final drive for trucks, and as regards mechanical efficiency there is probably not much to choose between the different systems available. Unfortunately data on relative weights is scarce.

For the bevel gears and the spur pinion it is customary to use alloy steel and to case-harden the gears, but the large spur gears are sometimes left unhardened, as the gear teeth naturally are subject to much less wear, and also are stronger than the pinion teeth. In order to insure smooth, noiseless operation one of the British firms using this type of axle "runs in" the gears before they are hardened, and in the hardening great care is exercised to prevent distortion.

For some of the illustrations accompanying this article I am indebted to *The Automobile Engineer*.



Double-reduction axle built by Wrigley of Birmingham, England's only axle manufacturer